SOAH DOCKET NO. 582-07-2673
TCEQ DOCKET NO. 2007-0204-WDW

APPLICATION OF TEXCOM GULF DISPOSAL, LLC, FOR TEXAS COMMISSION ON ENVIRONMENTAL QUALITY UNDERGROUND INJECTION CONTROL PERMIT NOS. WDW410, WDW411, WDW412 AND WDW413	)	STATE OFFICE OF ADMINISTRATIVE HEARINGS

SOAH DOCKET NO. 582-07-2674
TCEQ DOCKET NO. 2007-0362-IHW

APPLICATION OF TEXCOM GULF DISPOSAL, LLC, FOR TEXAS COMMISSION ON ENVIRONMENTAL QUALITY INDUSTRIAL SOLID WASTE PERMIT NO. 87758	)	STATE OFFICE OF ADMINISTRATIVE HEARINGS

REMANDED HEARING ON THE MERITS
TUESDAY, JUNE 22, 2010

BE IT REMEMBERED THAT at 8:02 a.m., on Thursday, the 22nd day of June 2010, the above-entitled matter came on for hearing at the State Office of Administrative Hearings, William P. Clements, Jr., Building, 300 West 15th Street, Room 404, Austin, Texas, before THOMAS H. WALSTON AND CATHERINE C. EGAN, ADMINISTRATIVE LAW JUDGES, and the following proceedings were reported by Leanna Lynch and Lou Ray Certified Shorthand Reporters of:

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P R O C E E D I N G S

TUESDAY, JUNE 22, 2010

(8:02 a.m.)

JUDGE WALSTON: We will go on the record in Docket Nos. 582-07-2673 and 582-07-2674 concerning TexCom Gulf Disposal.

Before we get started, I note we had an unopposed motion to treat Denbury Exhibit 17 as confidential. We've signed the order. I assume that is unopposed?

So we have signed that order. We have another motion by Denbury to present testimony of Dennis Ray Powell. Since we have just gotten this, I thought we'll look at it during the morning break and take it up after the break.

MR. RILEY: May I make a comment regarding that motion we received at 10:58 last night? First of all, we absolutely insist on the amount of time allowed by SOAH rules to respond to any motion, not just this motion, but any motion.

Secondly, there is the certificate of conference, which is incorrect, to put it mildly. As you know, Judge Walston, when you walked in the room yesterday morning, I was in an exchange with Ms. Mendoza. At 8:01, after the scheduled time to

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recommence testimony, I was given a ream of paper and told that I needed to confer with Ms. Mendoza at that time. It was simply inappropriate to be presented with a motion in that fashion. At no time did Ms. Mendoza ask me for a second opportunity to conference this motion.

So her assertion that I refused to conference motion is inaccurate, as you know from the record yesterday morning.

JUDGE WALSTON: I appreciate you revisiting -- you can tell us all that after the morning break. I haven't even read it. I don't even know what the motion says or the certificate of conference. You can request, at that time, additional time to make a response if you think it's necessary.

MR. RILEY: Certainly, Judge. But the pattern, I think, needs to be on the record. Because even if it is not offensive to you, it is certainly offensive to me, and I hope eventually to the Commission the way Denbury and its counsel have conducted themselves in this proceeding.

JUDGE WALSTON: We understand your position. We all welcome Mr. Humphrey back.

MR. HUMPHREY: It's a pleasure to be back. Thank you.

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JUDGE WALSTON: Okay. When we concluded yesterday --

MS. MENDOZA: Your Honor, there was one other additional matter I wanted to bring up. I know that yesterday TexCom discussed bringing Dr. Layne as an expert witness in this case, or I assumed they planned to bring him as a expert witness. We have gone back through all the disclosures in this case that we have received from them, and Dr. Layne has never been designated as an expert witness, and he has never been designated as a rebuttal witness. We are unaware of what the substance of his testimony would be. We do not believe that we have received any -- we just haven't received any disclosures or any of the expert discovery that is required under the rules of for civil procedure for Dr. Layne.

There were deadlines for designating experts in this case. There were deadlines for designating rebuttal witnesses in this case, and we have not received that. If it has been disclosed, I would appreciate seeing that. I see where he has been disclosed twice as a fact witness but never as an expert. I know that Dr. Layne has suffered a great personal tragedy, and I understand that he is not here today and they are planning to bring him back tomorrow,

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but I would prefer to raise this now rather than have him make a trip tomorrow and present this argument then.

So I wanted to raise -- we have concerns about this. The rules and the case law in Texas require that we be given proper notice and opportunity to discover -- conduct discovery about expert witnesses.

JUDGE WALSTON: Have y'all conferred about that yet?

MR. RILEY: No.

JUDGE WALSTON: I don't want to take a break now, but if you want to confer about it during the break, or sometime, we may consider it then. I don't even know if they are going to call him for sure.

MR. RILEY: Nor do I. I mean, the obligation is imposed of us in this order -- in your order -- is to give notice of reasonably foreseeable rebuttal witnesses. As you know, there was extensive questioning by Ms. Mendoza and others about the modeling in this case, which Mr. Casey supervised and Dr. Layne actually conducted it.

You will recall a number of responses by Mr. Casey's cross-examination questions that reference Dr. Layne. So whether it was foreseeable or not, we did not have reason to disclose him as an expert witness previously. It's not as though he has been a mystery to

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anybody. He has certainly been on the list of witnesses. It's been known sometime to Denbury and other parties that Dr. Layne conducted the modeling, so we do anticipate calling him, but we haven't even cross-examined Mr. Fairchild who is, I guess, the competing expert in modeling.

So at this stage, I can honestly say I don't know whether we are going to call Dr. Layne or not. So at this point, I would say he is not reasonably foreseeable. But when and if make a decision to call him, we will provide disclosures.

JUDGE WALSTON: I recall the circumstances in the testimony and my recollection of the orders is the same as yours, but I will go back and doublecheck the orders.

MR. RILEY: Thank you, Judge.

JUDGE WALSTON: We can take it up at that appropriate time.

We were -- I believe TexCom was in the process of cross-examining Mr. Herber.

Am I pronouncing that correctly?

WITNESS HERBER: Yes, sir.

JUDGE WALSTON: I just remind you, Mr. Herber, that you remain under oath.

WITNESS HERBER: Thank you.

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PRESENTATION ON BEHALF OF DENBURY ONSHORE, LLC
(CONTINUED)
JON HERBER,
having been previously duly sworn, testified as follows:
FURTHER CROSS-EXAMINATION
BY MR. RILEY:

Q Good afternoon, Mr. Herber. How are you today?

A Fine and yourself?

Q Fine. Thank you.

I think I have a few more questions of you, so hopefully we can move to completion of your examination rapidly.

Yesterday you were -- I think you gave Ms. Mendoza some numbers as it pertains to porosity of the middle Cockfield. Is that correct?

A Are you talking about my calculations, sir?

Q Yes, sir.

A Yes.

Q Remind me, since it's -- I don't know -- somewhere around 18 hours, what is your estimate of porosity for the middle Cockfield?

A Could I refer to those pieces of paper?

Q Certainly. Absolutely. Just tell us what you are referring to when you get to it, Mr. Herber. Okay?

A Certainly. Am I correct that I think these

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were all emailed to everybody -- copies of these?

Q Probably. Yes, sir. I have seen that before.

A What these pieces of paper represent, there is -- I use the divisions as per the TexCom of the Cockfield using their number, and you can see on here on the first page, it would be for the upper Cockfield for WD315, a summary report. That's why it's sumropt_depth.txt.

You can see that the top interval for the upper Cockfield is 5134 to 5629 with a gross interval of 495. What this is is a summary report from the log analysis that I did, and I believe that log analysis is provided in a graphic form to everybody, also. I'm not sure about that.

But anyway, this represents a calculation of effective porosity, which is different than total porosity.

Q Can one determine from a log either permeability or porosity?

A From a log you get a fairly accurate measurement of porosity. Each of the different porosity measuring devices has their limitations and liability. When you run several porosity tools together simultaneously, usually there are calculations to get a cross plot porosity, which is usually deemed by most

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people to be very accurate. Empirically, the industry has found that cross plot porosity corresponds very well with core measured porosity. So --

Q Let me understand the terminology that you are using. Cross plot porosity. Is that correct?

A Yes, sir.

Q You are saying that correlates very well with core porosity?

A Yes, sir.

Q And that core porosity is one that has been discussed earlier in this proceeding that was determined through lab analysis. Is that correct?

A I am speaking in general terms here.

Q But I'm asking in this case.

A Yes, sir.

Q In this case you have a log -- a well log. Correct?

A I do.

Q For WDW315. Correct?

A And we have some core -- we have a core report.

Q You have a core report for 14 feet of core in the lower Cockfield formation. Correct?

A Correct. May I proceed?

Q Yes, you may.

A So what the number on the far left -- it

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represents the average for that upper Cockfield interval of .29, and we are sort of kidding ourselves with that point -- that third digit.

So we should just, for the sake of discussion here, just call it 23 percent.

Q 23 percent. And that's from your analysis based on the tools you have available to you, namely, the well log and the core report. Correct?

A This number represents totally a calculation from the log.

Q Solely a calculation from the log. So this number you are giving us now is the porosity of the upper Cockfield formation. Correct?

A That is correct. If you flip to the next page --

Q Wait. Before we go on, what's the permeability of the upper Cockfield, based on your analysis, the one you have in front of you?

A What I did is --

Q Sir --

JUDGE WALSTON: Please just answer the question.

Q (BY MR. RILEY) What is the permeability of the upper Cockfield based on your analysis that's before you?

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A What I did is I --

Q Sir, what is the number?

A There is a range between 55 and 90 millidarcies.

Q So the upper Cockfield formation in the area of the WDW315 well is between 55 and 90 millidarcies?

A That's correct. That's the average using the average porosity.

Q Tell me the permeability now -- and you have explained your methodology, and those are in evidence. You can look at them if you need to refresh your recollection.

Tell me the permeability of the middle Cockfield in the area of WDW315.

A It is exactly the same as the upper Cockfield.

Q Tell me the permeability of the lower Cockfield in the area of WDW315.

A It ranges between 27 and 49 millidarcies.

Q 27 and 49 millidarcies. Correct?

A Yes, sir.

Q So the number we have been using in this proceeding measured by Mr. Fairfield's firm behind you, is incorrect? 80.9 is incorrect. Right? For permeability of the lower Cockfield.

A No, this is a different source of information.

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Q Sir, that's not my question. We need to get your opinion of what is the permeability, not an interpretation.

What is the actual value of average permeability in the lower Cockfield in your opinion?

A In my opinion, the different data sets say that there is a range.

Q Sir, give me the range, then, in your opinion of what is the permeability of the lower Cockfield in the area of WDW315.

A From the different data sets including --

Q Sir, can you give me numbers?

A I am.

Q You don't have to explain the qualification. Tell me your opinion on the numbers.

A Okay.

JUDGE WALSTON: If you can, Mr. Herber, I know there is always a tendency to want to explain, but our hearing has been going very long and just as precisely as you can, answer the answer.

A It's just my nature to qualify my answer.

Q That's apparent, but let's go on and just try to give us the numbers.

A In my opinion, the range of the permeability is somewhere between -- just to use round numbers 30 to 930

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millidarcies. On an average for the total --

Q Sir, you have given us the answer.

A Okay.

Q I appreciate your time, but let's confine yourself if you can because I would like to finish this examination certainly in our lifetime.

MS. MENDOZA: Your Honor, I am going to object to the sidebar and the treatment of this witness.

JUDGE WALSTON: I have given him his instructions, Mr. Riley, so just ask your questions.

MR. RILEY: Thank you, Judge.

Q (BY MR. RILEY) There is a graph, for lack of a better term, in the TexCom application.

Did you utilize that graph in making your evaluation of the permeability of the upper and middle Cockfield?

A Can you describe the graph in a little more detail, so I know what we are talking about?

Q Sure.

It's a graph that was generated from the lab. I believe it was OMNI labs.

MS. MENDOZA: Your Honor, I am going to object. I think this is going beyond the scope of my re-exam of this witness. He objected to my asking this witness about the OMNI lab core report. I was cut off

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in the middle of that examination. I didn't get to ask about it, and now he is going back and revisiting it.

MR. RILEY: That's simply incorrect. What counsel had the witness testify to was his estimate of porosity and, there, translated to permeability in the middle Cockfield. And I asked questions yesterday along these lines, and I'm just continuing with that examination.

By the way, there was no cutoff of her examination of the witness and giving his opinion about the porosity and how he derived that value of the middle and upper Cockfield in the area of WDW315.

MS. MENDOZA: I just want to be clear. I specifically started to ask this witness about the core report. I drew an objection from TexCom, and that objection was sustained.

MR. RILEY: Counsel is misremembering. She remembers when I pointed out that she had a different depth measurement for the porosity, and a different witness, by the way, and that's where she was cut off.

JUDGE WALSTON: I'll be candid. I don't remember either way. I'll overrule the objection at this point.

Do your best to confine it to the

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redirect.

MR. RILEY: Yes, sir.

May Mr. Lee approach the witness?

JUDGE WALSTON: Yes.

MR. RILEY: Thank you.

A Counselor, can you re-ask your question.

Q (BY MR. RILEY) Sure.

Do you see what's in front of you right now?

A I do.

MS. MENDOZA: Your Honor, I am going to reassert my objection, just for the record.

JUDGE WALSTON: Overruled.

Q (BY MR. RILEY) What is it, Mr. Herber?

A It's a standard industry cross plot between the measured permeability of the five core samples that was analyzed by OMNI under the direction of Crossroads.

MS. MENDOZA: I'm sorry. Could we find out what page in the exhibit so that we can pull up the correct --

MR. RILEY: That's where I was heading, Ms. Mendoza, if you would just give me a second.

A For everybody else, it's TexCom Exhibit 11, Page 144 of 270. This -- what I have before me is probably the -- has an additional line on there from you

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guys.

Q By "you guys," meaning TexCom. Correct?

A TexCom, sir.

Q But the original, the one you viewed, had a plot done by OMNI that correlated porosity to permeability?

A That is exactly right, Counsel.

Q Those samples done by the lab and that relates to the permeability based on air -- permeability in relationship to air moving through the formation. Is that correct?

A That's correct.

Q So those are not -- it's not a correlation based on fluid. Is that correct?

A That's correct.

Q Now, that is the basis of your extrapolation or it is one of the elements you used to extrapolate in forming your opinion about the porosity, and therefore, the permeability of the middle and upper Cockfield. Is that correct?

A Yes.

Q Now, there was some porosity information of another sample. There is a sample or a sample taken, I believe -- I'm sorry. I can't remember the precise depth, but it was the difference between .76 feet and

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.96 feet. Is that right?

A Yes, sir.

Q Now, you have extrapolated that line to depths that are not represented. Correct? On the chart.

A Could you explain what you mean.

Q Certainly. That information that's reflected in that chart is from five samples taken by OMNI labs from a core of 14 feet in the lower Cockfield formation. Correct? "Yes" or "no" sir, if you can.

A Yes.

Q And they simply plotted those points on a porosity versus permeability graph. Correct?

A Correct.

Q And the graph pertains to permeability to air. Correct?

A May I interject?

Q Sir, is that what the graph reflects?

A Yes, but those are more optimistic than if it were fluid.

Q Regardless of your opinion on what is optimistic or pessimistic, is that what they did?

A That's what they did.

Q You have extrapolated that line out further. Correct? Is that a way to think about it?

A No, sir.

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Q Let me explore that, then, and see if I understand your analysis.
You have simply taken porosity and interpreted permeability based on the line on that graph. Correct?
MS. MENDOZA: Objection. I think Mr. Riley is mischaracterizing the witness' testimony.
MR. RILEY: Then he will explain that to me.
JUDGE WALSTON: If it's incorrect, then he can say it's not correct.
A That's not correct. Would you like an explanation?
Q (BY MR. RILEY) No, sir.
Tell me what information you relied on to determine the porosity of the middle Cockfield formation.
A I relied on the TexCom log, and then an analysis of that log.
Q So you looked at the well log. Correct?
A Correct.
Q And you determined porosity. Correct?
A I --
Q Sir, "yes" or "no."
A I calculated porosity.

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Q You calculated porosity. What calculation -- tell me the formula you used.
So that we can all repeat your work, tell me what you looked at, what data value you determined, and then how you translated that into porosity for the middle Cockfield.
A Okay.
Q In factors, what's your formula? What do I look for on the well log? What value?
A I used all the values.
Q All the values. Let's get the well log out. Do you have it in front of you?
A No, I don't have it in front of me, sir.
Q Take a moment. It's up there somewhere. And I'll try to find mine while you are looking.
A Would you like me to use the calculated version?
Q No, sir. I would like you to look at the well log and show me where you got your information.
A Okay.
Q That's what you did. Right?
A Yes, I used --
Q All right. Then let's do that.
A Are we talking about this, or are we talking about that?

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Q I don't know what you are holding in your hand, sir. Why don't we stick with exhibits that are in evidence in this case.
Do you have one that is in evidence in this case?
MS. MENDOZA: I believe if we looked at Exhibits Denbury 22 or Denbury 23, those would be the source of the data.
Q (BY MR. RILEY) Let's put your personal copies away because I'm not sure what those are, and let's look at exhibits in this case.
JUDGE WALSTON: Mr. Riley, I think you want him to tell you how he calculated. If that's what he used, that may be what he needs.
MR. RILEY: It may be. I think he's talking about something that isn't in evidence, though.
Q (BY MR. RILEY) Tell us what you are looking at, sir.
A I am looking for the official Exhibit 23. Unless you want to let me --
MR. RILEY: I'd like for you to look at --
JUDGE EGAN: Hold on.
MS. MENDOZA: Your Honors, I believe we have -- we made extra copies so that all the parties have them, and we have two extra sets.

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JUDGE EGAN: Thank you.
A So everybody can follow along, I am looking at Exhibit 22. If you remember, yesterday there was basically three columns -- four columns if you want to be accurate. The one to the -- if you were to hold it vertical like this with depths getting smaller away from you and deeper as you -- towards your stomach. The ones to the left is Track 1, and then there is a depth track, Track 2, and then there is Track 3. Track 3 has the porosity information.
My methodology was -- initially was to digitize all these curves.
Q (BY MR. RILEY) Digitize. What do you mean you digitized them?
A We sent it out to a third party who would digitally trace these and convert this graphic representation into numbers.
Q So you sent this information out to a third party? When did you do that?
A Roughly a week ago.
Q Did you receive a report back from this company?
A I did.
Q When did you receive that report, sir?
A It took them several days.

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Q So about a week ago you sent it out to a third party. Who was that third party?
A I would have to refer to my records.
Q Please do. Take your time. I want to be sure that I understand the things you have done. So who did you send it to? If you can recall, great. If you can't, refresh your recollection if you have something with you.
A It would require a phone call.
Q Sir, maybe we can do that at the break.
A Okay.
Q But I'd ask that the witness be recalled, then, after he has had a chance to tell us who he has conferred with outside of this hearing.
A We requested the actual digits from TexCom, and we received them the day before I came here.
Q I'm sorry. I don't understand what you are saying.
A When this well was generated, the actual logging company, Halliburton, generates the digits in an ASCII file that's callid LAS. We finally got the LAS files -- I got the LAS files the day before -- I got them basically Saturday -- this last Saturday.
JUDGE EGAN: What is it called? L-A-S?
WITNESS HERBER: L-A-S.

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MS. MENDOZA: I want the record to be clear --
MR. RILEY: Is the record unclear? Is there some statement --
JUDGE WALSTON: Don't interrupt her, Mr. Riley.
MS. MENDOZA: I wanted the record to be clear that TexCom did release that data from Halliburton to us. At the same time it was provided to us, TexCom was copied on the LAS data as well from Halliburton.
Q (BY MR. RILEY) Is the LAS data that you are referring to that is the digitized version, or did you send it to another party after receiving the LAS?
A No. LAS is a standard format to read all curve information. It is basically just an ASCII file -- an ASCII file.
Q My question was: Was that data further processed before you.
Reviewed it?
A No, sir. It was original data directly from Halliburton -- emailed to me directly from Halliburton.
Q That's the data set you relied upon. Correct?
A Yes.
Q In that data set, what would I look for? What specifically -- what value did you derive as it pertains

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to the middle Cockfield, and where do I find it in the LAS files?
A You are asking about porosity, sir?
Q Well, I think I am because I think you told me that I should look at the third column of the well log. Correct?
A Yes. Every --
Q Sir, look at the third column, which seems to -- based on the notations apparently made by Halliburton -- the third column relates to porosity. Correct?
A That is exactly correct, Counselor.
Q So in the LAS files, there would be, I assume, a data set. Correct?
A There is a series of numbers.
Q Series of numbers. Okay. I would refer to that as a data set. Is that a fair characterization?
A That is exactly correct.
Q In the data set in the LAS files, you did something with that. Correct?
A I took those values.
Q So those are numbers. Right?
A Uh-huh.
Q And do you remember, are those -- in the LAS files, are they segregated in some fashion? How are

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they captured in that LAS file?
A When you look at an LAS file, it is a standard format developed by the Canadian Well Log Society. It has a header where they try to capture the information that's on the top of the log as to what the log is, who was the logging company, what are the scales, what are the -- just the basic background information.
And below that is a series of columns of numbers, and usually the first set of numbers in that column is the depth.
Q I am not trying to be rude. I really am not. But instead of telling us generally what's true, I am asking you specifically what you did as pertains to the LAS file we have been discussing.
MS. MENDOZA: Your Honor, the witness was answering his question. I understand he asked him specifically how is the data organized, and Mr. Herber was trying to answer that. I would ask that he be allowed to complete his answer so that we can understand this.
JUDGE WALSTON: I think that was the question asked unless you are not interested --
MR. RILEY: No, I am interested in -- I think the context was: What did you do in this case? Not generally how things are organized in life.

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In this case there was an LAS file, and I am trying to find out what this witness did with this particular LAS file, not a general LAS file that might exist somewhere else.

JUDGE WALSTON: I thought he was referring to this one.

MR. RILEY: No, apparently he was describing -- usually they are organized in this fashion, which is when I interrupted him.

A The porosity data is some set of numbers, and usually the shallowest number is at the top of the column and the deepest number at the bottom of the column.

So if you were to look at -- there would be a column labeled for some --

JUDGE WALSTON: You are talking about this one in particular?

WITNESS HERBER: Yes, sir, I am.

Q (BY MR. RILEY) I'm sorry. Let me ask a clarifying question, then. You said "usually" again. I am asking you about this LAS file.

A This LAS file has a mnemonic -- which means it is a shorthand thing, and each of the different log companies has their own set of mnemonics for the different porosity tools. So you can identify which

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data goes to which curve. So I took --

MR. RILEY: Objection, not responsive.

Q (BY MR. RILEY) Again, we are talking about something in the hypothetical sense. I'm asking --

JUDGE WALSTON: He was just about to say "I took," and tell you what he did.

MS. MENDOZA: If the witness would be allowed to finish his answer, I think we would actually get to the answer.

JUDGE WALSTON: At this point, I'll overrule your objection.

Mr. Herber, go ahead and tell us what you took.

A I took the porosity values from Halliburton -- in fact, I took all the curves from Halliburton and loaded them into a software program called PowerLog, which is owned by Jason Fugro. It was originally developed by Petcom. This is a standard software to analyze logs.

Then took that data and asked it to make sure it's in a standard format. So this data came in a sandstone matrix, and the software requires it to be in a limestone matrix. So I made that conversion on both the density and porosity curves.

Once that's done, it generates another set

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of values that would be one to one equivalent of the original data. All you are doing is just referencing it. You are not changing the data at all. You are just referencing it to a different standard. Instead of referencing it to a standard of sandstone, you are referencing it into a reference of limestone.

All the historical cross plots are in this limestone reference, so to get a cross plot porosity you have to have everything in limestone. Once that's done, then you can take the two curves and submit it to the software and have it generate --

JUDGE WALSTON: Just so we are clear, you said "you can do that." Is that what you did?

A I did. This is what I did. I'm sorry.

I took those two limestone reference porosity curves from the original density in neutron and asked the software to calculate the cross-plot porosity. Some -- this particular software -- it's a spine and ridge calculation as opposed to numerically adding the two, and then dividing in half, and giving you an average between the two.

So it's a little more sophisticated than most softwares. This spine and ridge is based on knowing which logging company -- it chooses a different algorithm based on what logging company is being used.

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The other thing I did with the data was take the gamma-ray curve and calculate a volume of shale. That volume of shale affects the porosity. Then I took that volume of shale with the cross plotted -- calculated -- I am trying to be precise. I took the calculated cross lot porosity and the volume of shale -- the same software calculates an effective porosity. The amount of shale in the particular sand affects its effective porosity.

That's where the resultant number came from, then the software can take any interval that you designate and numerically calculate the average of those values between -- that you select. And that's what I did.

Q (BY MR. RILEY) Are you through?

A Yes, sir, I am.

Q Did you preserve any of that work? Do you have something for us to look at to see what you actually did?

A Yes, sir. This particular software is actually pretty wonderful because it creates a journal of every step I took.

MR. RILEY: Objection, not responsive.

JUDGE WALSTON: Did you preserve the material?

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WITNESS HERBER: It's preserved in a journal in that software.
Q (BY MR. RILEY) Has the journal been produced? Has the journal been produced?
A No, sir.
MR. RILEY: I ask that the witness' testimony on this issue be stricken and that the witness' testimony in this matter further be stricken as a sanction. Since this witness is an expert, this journal should have been disclosed.
MS. MENDOZA: Your Honor, he just did this work. We can produce this work. This is an extreme sanction for something that is a small amount of testimony that counsel has led him into, but we are happy to produce that journal as soon as we can pull it off the computer.
MR. RILEY: Judge, this is not something counsel has led him into. Ms. Mendoza inquired of this expert about his opinion on porosity of the middle Cockfield, and then he gave further opinions on redirect examination. It's not something counsel led him into. The sanction is appropriate. The rules are clear.
JUDGE WALSTON: Hang on. One thing I am not clear on, Mr. Riley, is you say all of his testimony be stricken on this subject specifically. You have to

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be more specific than that. What are you talking about?
MR. RILEY: Certainly. I think --
JUDGE WALSTON: On porosity and permeability?
MR. RILEY: At least that's an appropriate sanction. I think a more appropriate sanction would be to strike this witness' testimony in its entirety because counsel, and apparently the witness, has not met its obligations under the rules of discovery, and particularly the rules of disclosure.
JUDGE WALSTON: Judge Egan and I will obviously need to confer on this. I tell you my knee-jerk would be not to strike his testimony in its entirety, but we need to be specific on what you think he has not properly disclosed.
MR. RILEY: The witness yesterday on redirect examination testified about his opinions extrapolated from the information he has just described for you on porosity of the middle Cockfield, and I believe it may have extended to the upper Cockfield.
Generally speaking, it is a subject matter -- I don't have a transcript in front of me, so I can't be more precise at this point, but there were a number of questions Ms. Mendoza asked about this witness' opinion, which apparently was formed on the

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basis of this analysis, which we have not been provided. And that's -- at least, as I said, the minimum we think an appropriate -- of an appropriate sanction. A maximum would be, of course, what I said earlier.
JUDGE WALSTON: Just so I am clear, and I haven't gone back and reviewed it. This is not anything that is, obviously, contained in his prefiled direct.
MR. RILEY: No, sir. That's part of my gripe.
JUDGE WALSTON: So you're talking about the redirect that was yesterday?
MR. RILEY: Yes, sir.
JUDGE WALSTON: Ms. Mendoza?
MS. MENDOZA: Your Honor, we have produced to them the resulting plots that came out of this. We produced that as it was generated. We were hampered by getting the digital data late in this case. As you know, we have been on a very tight schedule and we have been producing as soon as we knew of anything.
I was, unfortunately, unaware of this journal until just this moment. We are happy to produce it immediately. We will pull it down and get it to TexCom as soon as we can get to a computer, and striking this witness' testimony is an extreme sanction in this case.

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In addition, this witness has many bases for his opinions about permeability and porosity, not just this last work that counsel for TexCom is complaining about, and it would be inappropriate to strike all of that testimony as there is a multitude of bases for his testimony that has been produced to counsel well within the discovery timelines.
We have gone to extreme measures to comply with discovery in this case. We have been more than cooperative, and we will produce this information absolutely as soon as possible. And if we want to take a break now, we will get that information right now.
I'm assuming -- can we pull this information right now, Mr. Herber, or can we get somebody to pull it?
JUDGE WALSTON: Hang on just a minute before you go to that.
Mr. Riley, let me ask you this: It's still early to be taking a break. Is there another subject you can move onto now, and we will take your motion to strike under advisement, and at the break Judge Egan and I will --
MR. RILEY: I'll move on because I don't know how you will rule and I expect you will give it full consideration at the appropriate time. However, I

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will curtail my cross-examination in this matter until I have your ruling, and then subject to your ruling, we can return to Mr. Herber if need be.

Another thing, and I would like to point this out because extreme efforts and all the descriptors Ms. Mendoza used, simply, in maybe -- I don't know -- 10 minutes time on this subject matter, I found out about this journal. Certainly, it seems to me that the witness has an obligation to have produced that information or given that information to Ms. Mendoza.

Be that as it may, it is unreasonable to expect us to assimilate information that they have had or this witness has put together and studied, simulate that, and form questions in a moment's notice.

So regardless of whether Ms. Mendoza can produce it at this point, we are at an extreme disadvantage in having to look at that information, and then form questions. I am not a lawyer. I'm not a scientist. So I can only look at the information, but I need other people to help me. So the point being that a 10-minute break to look at information is not useful and it certainly doesn't satisfy the discovery obligations.

JUDGE WALSTON: I understand your point.

MS. MENDOZA: Your Honor, if by any means you are inclined to grant such a harsh sanction, we

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would make Mr. Herber available again after Mr. Casey -- after Mr. Riley has had sufficient time to confer with his experts to look at this. But this is truly an inadvertent matter. They have seen the results of this. They have got the electronic files from which this can be generated.

JUDGE WALSTON: I think Judge Egan and I understand both parties' position. If we can go onto another topic. I understand that, depending on our ruling, you may come back to this topic.

MR. RILEY: Thank you.

Q (BY MR. RILEY) Mr. Herber, is it your testimony that the geology of the oyster bayou formation is the same -- are you amused, sir? Am I amusing you? I'm sorry.

A Sir, I am generally a happy person.

Q Me, too. I apologize for misunderstanding your facial expression.

The oyster bayou formation is identical to the Conroe formation or the Cockfield formation?

A No, it's apples and oranges, sir.

Q So when you referenced oyster bayou, you were comparing an apple to an orange. Correct?

A I was. Do you want more information?

Q No, sir, I don't.

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Sir, are you a geophysicist?

A I am what you would call an interpreter.

Q Of language? Are you a geophysicist is my question.

A I interpret geophysical data. I am not a geophysicist.

Q Is that a subspecialty of geology -- geophysicism or geophysicists?

A The interpretation of geophysical data is not just limited to just geophysicists. Usually geologists, because they have an understanding of depositional systems --

JUDGE WALSTON: Mr. Herber, if you can answer his question. Is geophysicism -- or whatever it's called -- a subspecialty of geology?

WITNESS HERBER: No, sir.

Q (BY MR. RILEY) So there is no such thing as someone who is a geophysicist. Is that correct?

A No, there are people who have a title of geophysicist.

Q Is it just a misnomer that all geologists are geophysicists?

A No.

Q Sir, do you have a degree in geophysical science?

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A I do not.

Q Are you qualified to interpret 3D seismic information?

A I am.

Q Who has conveyed on you or conferred on you the mantle of being able to interpret 3D seismic. Is there a degree, is there a subspecialty, is there any kind of acknowledgment of your claim that you are capable of interpreting 3D seismic information?

A It's through practice.

Q So the answer is "no," then? You do not have any external verification of your qualifications. Is that correct?

MS. MENDOZA: Objection. I'm not sure exactly what qualifications counsel is referring to specifically.

Q For instance, in the practice of law when someone specializes in a subcategory of the practice of law, there is something called a board certification. Can you get that concept?

A I understand.

Q In the practice of geology, is there a subcategory under the heading of geologist or geology that relates to geophysical interpretation?

A There is not an equivalent to what you

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portrayed in the geological profession.
Q How does one, then, label themselves, in your experience, as a geophysicist?
A There are many geoscientists who practice geophysics more routinely than the geological -- geo side, so they title themselves and portray themselves as geophysicists. So it's merely a matter of --
Q Sir, there is no question in front of you.
JUDGE WALSTON: I think he is finishing his answer.
MR. RILEY: Okay. Go ahead, then, if I cut you off.
A There is no certification to be a geophysicist or a geologist as a practitioner. Most companies will soon find out if you have credible interpretations. The proof is in the pudding. If you interpret --
JUDGE WALSTON: I think you are going beyond it now. Your answer is there is no certification. Correct?
WITNESS HERBER: Yes, sir.
Q (BY MR. RILEY) So in the practice of geology in the State of Texas, are you familiar with the rules and requirements for licensure as a geologist in the State of Texas?
A I have a rough idea, sir.

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Q Within that -- there is an agency created -- right -- that sort of presides over the licensure of geologists in the State of Texas. Is that correct?
A There is an agency that allows geologists to register, if they so choose.
Q Is that your full understanding of what the regulatory requirements are for practice of geology in the State of Texas?
MS. MENDOZA: Your Honor, I am going to object. I don't think that his preceding question called for his full understanding. It was about the agency.
JUDGE WALSTON: He is asking him now. So overruled.
A The agency was formed somewhere between five and ten years ago. If you so chose at that inception, you could be grandfathered in. Currently the minimum experience requirement is to have five years experience, and you have to take several tests to become a registered geologist in the State of Texas.
Q (BY MR. RILEY) Not just registered. Right? It's licensure. Correct?
A No, I believe the correct term is registered.
Q Okay.
What agency administers that test and

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presides over the licensure or registration requirements for the practice of geology in the State of Texas?
A I do not know the actual name. It's a state agency.
Q In the rules governing that state agency -- the rules they promulgated or the statutes that have been adopted by the legislature, is there any notion of subcategorization or subspecialization in the practice of geology, if you know?
A To my knowledge, I don't think there is any distinction. It's either, you are a registered geologist or you're not. But I profess not to know all the details of this regulatory body.
Q You have described a fault -- my notes are somewhat incomplete, so let's go to the faults that you interpreted from 3D seismic information.
A Yes, sir.
Q First of all, tell me how many you discovered in your analysis.
A I was focused within the two-and-a-half mile radius, which is -- and I used that map from the TexCom exhibit that showed what we have been discussing as the 4400-foot fault, which is 4400 foot away from the TexCom well at the top of the Cockfield, and then there is an additional fault to the south on the TexCom exhibit that

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looks like a zig-zaggy sort of thing.
Q Sir, let me try to get this -- how many did you discover?
A Two.
Q Two faults. In the area of review or the 2.5-mile radius around WDW410 and 315?
A That I can see in the seismic.
Q Since my questions are about the seismic and your interpretation about the seismic, can we assume for this line of questions that that's what we are talking about?
A Yes, sir.
Q So you discovered two faults. Correct?
A Yes, sir.
Q Let's start with fault number one, which I think you described as the 4400-foot fault that we have been describing -- discussing throughout this case. Is that right?
A Excuse me. Two additional faults.
Q Two additional faults. I'm sorry.
So the 4400-foot fault is not -- you verified that on the 3D seismic. Is that correct?
A It's apparent to the casual observer.
Q I wouldn't know because I haven't seen that, but let's just take your word for it for now.

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A Thank you.
Q The other two, then, that you claim you found on the 3D seismic, where are they located?
A There is one that's between the 4400-foot fault, and the other fault described by TexCom is roughly in between those two. So it would be further away from the TexCom well.
Q We are going to have to understand what you said.
So there is some other fault -- you said there were two that were discovered by TexCom. Correct?
A There is two portrayed on their map.
Q Let's start there. Where are the two portrayed on TexCom's map? Which faults are they?
A The 4400-foot fault, and then there is a -- I don't know the official name used by TexCom. There is a fault on the very southern edge of their map that looks sort of like a zig-zaggy thing. And from the 3D, that actually is two different faults. That's why -- instead of one, it's two.
But I'm not going to quibble about that interpretation. There is a break in the strata in that general area. I found an additional break in the seismic in between those two faults.
Q So I am imagining -- let's go to the board.

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Why don't you flip the page, let's get you to draw a circle first if you could. Do you have a marker? I am asking you to draw a circle because I want you to label that -- the area of review at 2.5 miles. Is that fair?
A That's good.
Q Write 2.5, and then for shorthand why don't you put AOR, area of review.
(Witness complies)
Q (BY MR. RILEY) Now, if I am understanding correctly, the center of that circle ought to be WDW410. Right?
A Okay.
Q Why don't you go ahead and write the letters WDW410.
(Witness complies)
Q (BY MR. RILEY) Now, do you have another color marker? Maybe a red one?
A I do.
Q Would you put on that -- in that area of review where TexCom identified faults in the lower Cockfield. I want to emphasize "in the lower Cockfield." Okay?
A Okay. Give me a moment here.
Q Take your time.
A TexCom structure map is at the top of the Cockfield.

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Q Is there potential for difference in the lower Cockfield, then?
A There is.
Q So the structure map that you said you referred to earlier as TexCom's identification of faults -- right -- that's what I understood you referred to. That's at the top of the Cockfield. Correct?
A That's correct.
Q So what did TexCom identify as faults within the area of review at the top of the Cockfield?
A That would make things much quicker if we did that.
Q Why don't you go ahead and do that, then.
A So this distance here is not exactly -- roughly 4400 foot.
JUDGE WALSTON: Mr. Herber, while you are up there, be sure and speak up real loud because you are not at the microphone.
A So this is roughly the 4400-foot fault.
Q (BY MR. RILEY) Why don't you go ahead and label that so we don't forget.
A I understand.
Q You have made some other mark that I didn't ask you to make, but you have done it, which looks like some lines on the left side of the diagram below a straight

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line -- more or less a straight line that you have labeled 4400 feet. What is that?
A That shows the direction of throw. This is just common shorthand. This is the upthrown side and this is the downthrown side.
Q You will understand in a minute why this is important, but you have indicated that above the line on the piece of paper is the upthrown side. Is that correct?
A Correct.
Q And below the line on the piece of paper is the downthrown side. Correct?
A Correct.
Q And by "the line," I am referring to the red line.
A Correct.
Q Please continue, then. You said you identified some other faults. Let's get another color.
MS. MENDOZA: I'm sorry. I think you had asked him to identify on this both of the faults.
Q (BY MR. RILEY) I apologize. There is another fault that you wanted to point out that you said you found in the area of review based on TexCom's mapping of the upper Cockfield. Correct?
A Yes, it looks something like this on their map.

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This may be exaggerated slightly.
Q That's fine. I think it's in the application. Correct?
A Correct.
Q Let's label that, though, so we don't lose track. It's another red line at the bottom of the circle depicting the area of review, and let's call that TexCom F-2 -- the second fault, F-2.
A Okay.
Q Now let's get another color. And where did your interpretation occur?
In other words, you mentioned that TexCom identified faults in the upper Cockfield. What are you referring to in your identification of additional faults in the 25-mile radius as you see it? Is it in the upper Cockfield, middle Cockfield, or some other formation?
A We described this yesterday, but it basically starts at some point in the Jackson and goes all the way to the lower Cockfield. It's somewhere in the middle of the lower Cockfield.
Q Somewhere in the middle of the lower Cockfield?
A Right.
Q I need you to be more precise. How deep into the Jackson, in your opinion, is this fault that you have identified from the 3D seismic. And by "deep," I

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assume it's at the bottom of the Jackson. Correct?
A Yes.
Q At what depth does the fault begin?
A I would have to look at -- all the seismic data, as you know, or may not know, is in time.
Q That means nothing to me. What depth is the --
A I'm trying to answer your question.
What, basically, you are doing is you are measuring the time it takes the seismic energy to leave the surface and bounce down off this particular reflector and come back up. That's in time. And there is no way to convert that time to depth without a velocity control point that you actually measure in a well.
There are two such points in this area. One is that 86 well, and one is 2315 well. So we have some velocity control on that. I would have to look at that velocity control chart to tell you that answer. It's in the data set over in my --
Q Let's assume we don't have time for that this morning.
A It's somewhere in the middle of the Jackson.
Q The Jackson is 1000 feet. Is it 500 feet into the Jackson based on your interpretation?
A Roughly.

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Q Go ahead and now draw it, I guess, on the diagram.
(Witness complies)
Q Okay. Now, you have drawn a green line -- let me describe it -- that is south of the 4400-foot fault. Am I understanding your diagram so far?
A Correct.
Q And it looks like the assembly you used for -- indicating upthrown and downthrown side is on the other side of the line, meaning at the top of the diagram. Would that mean it actually goes in the other direction?
A Correct.
Q So what's the throw of this fault?
A Once again, I would have to look at that time depth relationship. But it's large enough to displace the adjacent reflectors.
Q I hear what you are saying, but I need you to tell me, based on your interpretation of the seismic information that you have testified about, what is the throw of the fault you have described for the ALJs?
A It's somewhere in excess of 100 feet.
Q Why don't you put the symbol for greater than 100 feet.
(Witness complies)
Q (BY MR. RILEY) What is the distance from the

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line -- the actual distance, not on the piece of paper -- the actual distance of the 4400-foot fault to the green line in the subsurface. How close are they?
A What horizon are you asking? At the top of the Cockfield?
Q Let's talk the lower Cockfield.
JUDGE WALSTON: Talk a little louder, if you can.
Q (BY MR. RILEY) No, let's talk about the lower Cockfield.
A At the lower Cockfield, it actually intersects this point.
Q So it's part of the 4400-foot fault?
A No, it dies into that. What you are basically looking at is a Y.
Q We are looking at a Y? So in the lower Cockfield, then, would it appear -- if you were mapping the lower Cockfield, would it appear the same as the 4400-foot fault?
A No, at the top of the lower Cockfield there would be a slight separation. This line would move closer to it.
Q How far away?
A Once again, I would have to measure it on the actual data. There is a ruler where you can pick a

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point, and then move out and actually measure those distances.

Q Can you give us any idea, as you stand here testifying in this matter, of the distance between the 4400-foot fault and this other fault that you have identified in the lower Cockfield?

A Once again, I would be remiss if I said anything without actually measuring in the data. I didn't do that.

Q You have had the data for some time. Right? You have looked at 3D seismic. You have had that since at least May 20, because you have described it for me in your deposition. Is that right?

A I did.

Q So sometime prior to that when you did your evaluation, you had an opportunity to discover the distance. Correct? In the lower Cockfield.

A I understand your question, Counselor, but I didn't make that measurement.

Q Yet you have told us that it is something different from where the 4400-foot fault is located at the top of the upper Cockfield -- excuse me -- top of the lower Cockfield.

A All I was pointing out is there is additional faults.

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Q Excuse me?

A All I was doing was pointing out there was additional faults.

Q When do they join, then? When do these faults, that you say are additional faults, when do they join in the lower Cockfield, or do they?

You said it's a Y.

A Yeah, it's --

Q Would you put the letter Y up there in the corner -- either corner. It doesn't matter.

A Can I draw another diagram for you?

Q No, sir. I asked you to write the letter Y -- just the letter Y.

MS. MENDOZA: Your Honor, I would like to ask -- when we get to a good point I would like to ask the Court's indulgence to take a very brief break.

MR. RILEY: I would be happy to do that now if it's convenient to everybody.

MS. MENDOZA: I just need to take a very brief break for a second.

JUDGE WALSTON: Let's take a 15-minute break. We'll resume at 9:20.

(Recess: 9:04 a.m. to 9:26 p.m.)

JUDGE WALSTON: We will go back on the record.

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Judge Egan and I were able to confer during the break. Concerning Denbury's motion to present testimony of Dennis Ray Powell, we are going to deny that motion. We will certainly take into account the affidavit that's attached just as we will take into account TexCom's affidavits, but that motion will be denied.

MS. MENDOZA: Your Honor, if I can ask one question. I just wanted to know what the practice has been, I'd like to make an offer of proof of his testimony.

Is that something we just do during a break?

JUDGE WALSTON: At the conclusion of the hearing. You can do it at the conclusion of the whole case, if you desire.

MS. MENDOZA: Thank you.

JUDGE WALSTON: Concerning TexCom's motion to strike -- well, first, TexCom's motion to strike all of Mr. Herber's testimony is denied. We still have a little question about the testimony concerning -- the specific testimony concerning porosity and permeability. We had a question -- are the parties -- are you getting daily copy of the transcript?

MR. RILEY: We are not. I think Denbury

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is.

MS. MENDOZA: We are not. We got daily copy of one small portion of it where we wanted to have seen an argument that was made. But that was the first day. It was not yesterday. So we do not have daily copy.

JUDGE WALSTON: We would like to -- if you can get it for yesterday and point out the specific parts that you want stricken before we can make an intelligent ruling on it. If it will be necessary, we may need to recall the witness.

MR. RILEY: I understand.

JUDGE WALSTON: We need to have it to make a general ruling -- yeah, we are going to strike it, but then nobody really knows the specific parts of it.

MR. RILEY: I understand.

JUDGE WALSTON: So that part is still taken under advisement.

MR. RILEY: That's more than fair. I will work with the reporter and get that testimony and present it to you as soon as I can.

JUDGE WALSTON: With that, Mr. Riley, you can proceed with your cross-examination of Mr. Herber.

MR. RILEY: Thank you.

Q (BY MR. RILEY) Mr. Herber, you were at the

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board working on the easel.
(phone ringing)
A (BY MR. RILEY) Excuse me.
Q If you need to take that call --
MR. RILEY: Why don't we get the exhibit marked. I think it's TexCom Exhibit 103, if I am keeping track accurately.
(Exhibit TexCom No. 103 marked)
Q (BY MR. RILEY) Mr. Herber, I asked you to write the letter Y, and I think you have done that. It seems backwards to me, but I think you were trying to depict your interpretation of the seismic data as it pertains to our discussion of the 4400-foot fault and what you call the other fault, which is marked in green, on Exhibit 103. Is that correct?
A Yes, sir.
Q It's more of a backwards Y. Is that fair?
A I was, as you observed, trying to portray something that was basically going like this.
Q I understand.
So on the Y, could you indicate where would the top of the Cockfield formation be on the Y. If I am understanding, we are looking into a plane. Correct?
A We would be looking at -- transect basically

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through -- like that.
Q So as I understood your testimony earlier, the green line persists in the lower Cockfield formation. Is that correct?
A Yes, sir.
Q So you talk about the top of the lower Cockfield. Could you indicate on the Y, then, where you think the top of the Cockfield would intersect with the Y?
A I'll actually draw -- do one better. I'll draw all sides of the fault.
JUDGE WALSTON: You are talking about the top of the entire Cockfield?
Q (BY MR. RILEY) Yeah, just the top depth --
A I'll draw --
Q Top of the lower Cockfield. I'm sorry.
JUDGE WALSTON: Top of lower Cockfield?
MR. RILEY: Yes, sir.
A I thought you said top of --
JUDGE WALSTON: Yeah, I misunderstood, too.
Q (BY MR. RILEY) I probably said it wrong. The top of the lower Cockfield. Does it intersect with the Y that you have drawn on the diagram?
A So this black line will represent the top of

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the lower Cockfield in a cartoon sense.
Q I understand.
A So here it is, and it would be dipping off, and TexCom well will be roughly out here.
Q Let me describe what you have now indicated. You put your hand on the left side of the paper, and you are indicating off the page to the left. Correct?
A Yes.
Q And so the top of the Cockfield would fall off in the direction of the TexCom well. Correct?
A The lower Cockfield would be here, and it would be somewhat like this (indicating).
Q So let me -- the diagram gets stranger every second. The first black line that you drew to the left of the red line indicates the top of the Cockfield formation?
JUDGE WALSTON: Top of the lower Cockfield.
Q (BY MR. RILEY) That's what I want to be clear about.
A You asked me to draw the lower Cockfield.
Q Yes, sir. I just want to be sure that's what you drew.
A Yes, sir.
Q So that's the top of the lower Cockfield.

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Correct?
A Right.
Q And in the branches of the Y you have drawn another black line slightly lower than the line on the left side of the red line, and that's the top of the lower Cockfield. So it's dropped, in geological terms, in stratum down some distance. Correct?
A It's the downthrown side.
Q And then apparently the other fault you have described -- the green line -- the upthrown side is to the south. Correct?
A Correct.
Q So you have drawn, again, the lower Cockfield -- top of the lower Cockfield at -- I guess I'll call it higher -- in the diagram or at the top of the page, and that's -- it's to indicate the upthrown side as it pertains to that fault. Correct?
A Correct.
Q Now, is there a way to determine, in geologic terms, whether this is the same fault? In other words, did it occur at the same time?
A The short answer is, based on -- the age of the fault is roughly the average of the sediment that it's breaking. That's your -- you can't nail it down exactly.

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Q But it could, then, have occurred at the same time?
A What you have to do --
JUDGE WALSTON: Just could it have occurred at the same time?
A It could have or it could not have.
Q (BY MR. RILEY) The -- referring to -- let me set up the question.
Have you reviewed all the geologic testimony in this matter? By that, let me be more precise. Both the prefiled testimony in this rehearing, as we sometimes call it, and the testimony in the original hearing from December 2007?
A May I sit down?
Q I don't want to torture you if you are weary.
A No, it's a matter of the microphone.
Q Yes.
A I don't think I have reviewed every scrap of information as related to this hearing. I have reviewed as much as I can in the time allowed.
Q So you probably -- let me ask you: Did you come across any testimony where terminology was developed referring to a chicken foot?
A I don't remember that.
Q I apologize for not doing this in some order,

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but I think you described two faults that you identified -- two additional faults that you identified from the 3D seismic information, and you have only drawn one of those two. Is that right so far?
A That's correct.
Q I am sorry to have you rise again, but would you please rise and approach the board and find another color, if you have one.
If you need to use green -- green is just as good as anything, I suppose. Could you draw it on the area of review?
A Would black be sufficient?
Q Let's go with green, so that way it will be the additional faults that you have discussed.
A If this is 4400-feet --
Q Yes, sir.
A -- at the top.
Q By "this" -- let's go ahead and mark that distance, then. I understand that, but you just indicated, so we need to preserve this for the record. If you will just write the distance from the TexCom well to the red line and indicate that as 4400 feet. Correct?
A Does that work?
Q While we're doing this, let's continue, then.

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The green line you have drawn toward the bottom of the page is the -- one of the additional faults you identified -- at what horizon did you draw it in the diagram?
A This is all --
Q So you have written on the top of the page, "Top of the Cockfield." So that's the horizon we have been discussing. Correct?
A This is a rough spatial relationship.
Q Can you give us a distance from between -- at the top of the Cockfield between the branches of the Y or the red and green line on the diagram?
A No, we've been over this before. I would have to go to the data and make that measurement.
Q The other fault -- I just asked you to stand up to draw it, so would you please do that now.
A And maybe I don't have -- I should have Wite-Out. I meant it to be half the distance. I said yesterday it's roughly 2000-feet away.
Q Rather than just scribble on the diagram, let's just label the distance, then. So half the distance of 4400, is 2200 feet. Is that your testimony?
A Roughly 2000, plus or minus.
Q Fine. Would you just indicate the distance, then, between the TexCom well and the second fault you

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are describing.
(Witness complies)
Q (BY MR. RILEY) In relative terms, have you drawn those faults -- the additional faults that you say exist at the top of the Cockfield, have you drawn those, in relative terms, for the distance you discovered in the seismic? In other words, the red line is much longer than the two green lines.
Are you depicting a relative length of the fault?
A The lengths are approximately -- this is a good cartoon, I think.
Q I promise you you will resent saying cartoon at some point in life. What you are talking about is this is not anything more than a schematic.
A That's exactly what I am trying to imply.
Q The fault at the top -- let's call that F-3 -- that's not going to work. I tell you what, let's call that Herber 2 -- H-2. That will be Herber 1. Yeah, the first line you drew, let's call that Herber 1.
A How about H-1?
Q H-1, yes. Just so the record is clear, you have labeled the first fault that you depicted in green H-1, as we discussed; and the second fault you have described and now drawn is H-2. Correct?

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A That's correct.
Q What is -- you have not indicated a throw on H-2. Why is that? Maybe because I didn't ask you to, but were you not able to determine the throw of that fault?
A I haven't made a determination on throw of either of the faults. It's something I could do, but I just haven't done.
Q Well, at least you have done upthrown and downthrown on H-1. Is that correct?
A Correct.
Q Can you do upthrown and downthrown on H-2?
A My memory escapes me, sir. I would have to look at the data to give you an accurate answer.
Q The direction of the fault, H-2, is it your testimony it runs east and west?
A Yes.
Q For what distance? I know you have indicated relative distance, but a relative length of these faults, in your opinion, can you tell us precisely or even generally what distance it runs?
A It's is relative. Distance is relative. It's probably drawn correctly. It's probably a total 2- to 3000-foot length on this guy here.
Q So it runs east to west, in your opinion,

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approximately 2- to 3000 feet?
A In my testimony, it's a small fault that we identified with coherency-type part of the side. This fault here is very apparent just using your standard amplitude or variable density. So this thing here is something everybody would see. This thing here requires a little more imagination using a slightly different part of the software.
Q Let me describe what I think you have indicated. H-1 you said is obvious to anybody. Correct?
A I did say that.
Q And H-2 is something that requires more interpretation of the information than the 3D seismic. Is that correct?
A Yes, that is correctly stated.
Q Is that because the throw of H-1 would be -- the throw of H-2 would be much less than H-1?
A That would be fair to say.
Q These are the -- we now have a complete set of your interpretation of faults in the 2.5-mile area of review? In other words, we have two additional faults, what I heard you say, in addition to the 4400-foot fault. Correct?
MS. MENDOZA: Objection, form. He has

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asked two different questions. One is, we have identified two; and the other is, do we have a complete set of your interpretations?
MR. RILEY: Let me rephrase.
JUDGE WALSTON: Rephrase the question, please.
Q (BY MR. RILEY) You identified in redirect examination and cross-examination that you found two additional faults based on the 3D seismic. Correct?
A That's what I said.
Q That's what you have drawn? Correct?
A That's what I've drawn.
Q Please sit down, if you would.
JUDGE WALSTON: Let me ask one quick question to clarify to make sure the record is clear. We had some confusion on this a while ago.
When you write "top of the Cockfield," are you talking about the entire Cockfield, like, top of the upper Cockfield, or top of the lower Cockfield, or what are you referring to?
WITNESS HERBER: I am talking about TexCom's top of the Cockfield here.
JUDGE WALSTON: Of the entire Cockfield?
WITNESS HERBER: Of -- the entire Cockfield would be at the top of those little stray

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sands -- Cockfield sands.
JUDGE WALSTON: TexCom indicated a lower, middle, and upper. What's this the top of if their --
WITNESS HERBER: That's TexCom's top of the upper.
JUDGE WALSTON: Upper. Okay.
MS. MENDOZA: I want to make one clarification, just so we are clear. I think the Y, though, he has drawn the top of the lower Cockfield as shown by --
JUDGE WALSTON: I understood that. But that's why I wanted to be clear here what he is talking about.
WITNESS HERBER: That would be a good thing to label.
JUDGE WALSTON: It's Mr. Riley's chart.
Q (BY MR. RILEY) I think it's kind of a cooperative effort now, so let's go ahead and do that.
A Okay.
Q Thank you.
MR. RILEY: TexCom offers Exhibit 103 into the record.
JUDGE WALSTON: Any objection?
TexCom Exhibit 103 is admitted.
(Exhibit TexCom No. 103 admitted)

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Q (BY MR. RILEY) Mr. Herber, I think I just have a few more questions, and then we can move onto the next witness, hopefully.

Is it your opinion that there is no such thing as an upper, middle, and lower Cockfield?

A It is my opinion that the division of the Cockfield by TexCom is arbitrary.

Q Is it your understanding that TexCom developed the nomenclature of upper, middle, and lower Cockfield sands?

A In the literature, I have seen the Cockfield divided numerous ways.

Q Let's try my question, then.

Is it your opinion, or is it your understanding that TexCom developed the nomenclature upper, middle, and lower Cockfield?

A There are some other authors that have used that nomenclature, but --

Q Sir, really, I have just asked you that question.

Is it your understanding that TexCom developed that nomenclature? My understanding, then, of your answer is "no." TexCom was not the originator of the terms upper, middle, and lower Cockfield. Correct?

A There are other authors that use upper, middle

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and lower to divide the Cockfield.

Q That's probably been since TexCom filed its application. Right? Because I asked you if it was the originator of those terms. And you keep answering me that other authors have referred to it that way.

Are they the originator, "they," TexCom and its consultants, the originator of the terminology upper, middle, and lower Cockfield?

A If TexCom would have identified the top of the Cockfield directly, this discussion wouldn't have to happen.

JUDGE WALSTON: If you can answer his question, if you know. Do you know if they originated it or not?

MR. RILEY: I move to strike that answer since it was not responsive.

JUDGE WALSTON: That will be stricken.

Do you know if they originated it or not? I understand your testimony others have used it, but his question is: Did they originate it, do you know?

A I don't think they did.

Q (BY MR. RILEY) In your research, what was the earliest reference you found to the nomenclature upper, middle, and lower Cockfield?

A In the articles I have read, I didn't see

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anybody use that terminology other than TexCom.

Q A moment ago I thought you said that you were aware that other authors had used that terminology?

A I have read numerous articles. It's been so long ago since I remember somebody dividing into three. I can't reference which that one was.

Q Let's go over this, then.

How many articles have you read?

MS. MENDOZA: I am going to object as vague.

Q (BY MR. RILEY) On the topic of the discussion regarding the Conroe oil field, you said there were numerable -- I can't imagine that's true, but let's see how many you read.

A There are a lot of regional papers I read for the whole Yegua trend. The Yegua trend is a very important oil and gas trend.

So I have read lots of articles about the Yegua trend.

Q Now you have introduced a new term into the discussion.

A Yegua and Cockfield are synonyms.

Q I actually knew that, but let's be clear on the record.

Can we use Cockfield, then? Since they

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are synonyms, certainly we can use Cockfield. Correct?

A Cockfield is a synonym that's sort of confined to the eastern part of Texas into Louisiana. It's not a common term when you go further south.

Q I thought you told me a moment ago they were synonyms?

A They are synonyms in this area of Conroe Field.

Q Let's be more precise, then. Can we use Cockfield since that's what we are talking about? The area of Conroe Field, can we use Cockfield formation even though you might think of it more generally as Yegua?

A We can.

MS. MENDOZA: So that we are clear, when we are using Cockfield right now for this discussion, he is talking about in this vicinity. I want to make sure that I understand what's being asked.

JUDGE WALSTON: Is that what you are asking?

MR. RILEY: Sure. Why not?

MS. MENDOZA: Thank you.

Q (BY MR. RILEY) Did I misunderstand you a moment ago when you said there were other authors that referred to or have used nomenclature upper, middle, and Cockfield formation?

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A There are other authors that have divided the Cockfield into three divisions. There are authors that have divided into two. There are other authors that have divided it into none.
Q I keep asking question and you keep answering --
MR. RILEY: I move to strike that answer. I asked him if there are other authors that used nomenclature?
JUDGE WALSTON: I'll overrule your objection. Let's move on. Let's get through this.
Q (BY MR. RILEY) What authors are you aware of that have used the nomenclature upper, middle, and lower Cockfield?
A I have already addressed this. I can't remember right off the top of my head.
Q You have addressed it in several different ways. You have mentioned that there are articles or other authors that have used that nomenclature, and then you said you are not aware of any articles that have. So I am trying to understand your testimony.
JUDGE WALSTON: He said he can't recall their names.
MR. RILEY: I'm sorry.
Q (BY MR. RILEY) Have you reviewed articles that

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refer to the upper, middle, and lower Cockfield?
MS. MENDOZA: Your Honor, I am confident that this question has now been asked and answered several times. Mr. Herber has clearly said that he has read articles, and he cannot remember the authors.
MR. RILEY: That's okay because I can ask the next question, then, if that's clearly established.
Q (BY MR. RILEY) Did you review those articles in preparation for your testimony in this case?
A No, I tried to be more specific. I tried to read articles that were germane to the Conroe Field.
Q And all the articles that you reviewed forming the basis of your testimony have been produced. Correct?
A To the best of my knowledge.
Q How many articles did you review in preparing your testimony in this case?
A I could probably go over and count them out of my notebook, if you like.
Q Well, let's just move things along. You have produced all those to Ms. Mendoza. Correct?
A And to you.
Q Well, I am sure Ms. Mendoza produced them to us, but you didn't produce them to us. Correct?
A I didn't. No, sir.

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Q So you produced them to Ms. Mendoza. So I have the entire set of articles you reviewed. Correct?
MS. MENDOZA: I think that the answer --
Q (BY MR. RILEY) In preparation for your testimony?
A Yes.
Q In any of those articles, is there any description of separation in the Cockfield formation in the context of what we have been discussing?
A No.
Q Just a few more questions.
I thought yesterday when you were describing the -- I'll call it layers between the lower and middle Cockfield in response to Ms. Mendoza, you described it as a -- layers of sand, silt, and shale. Did I remember that right?
A Can you re-ask that question? Are you talking about the shale in between the top of the lower Cockfield and the middle Cockfield?
Q Yes, sir.
A Yes, I refer to it as thin-bedded layers of silt and sand with shale.
Q What is the thickest layer of shale in that area? How thick is it?
A May I look at the log?

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Q Certainly.
A There are two intervals in here that would be portrayed by me as being on the pure end of a proximal shale.
Q Before you go on, let me see what you are lacking at so the record is clear. What are you referring to?
MS. MENDOZA: I think he is asking what exhibit number --
Q (BY MR. RILEY) What document?
A I'm sorry. I am looking at Denbury Exhibit 22, which was originally TexCom Exhibit 11, Page 120 of 270.
JUDGE EGAN: Page what? I'm sorry?
WITNESS HERBER: Your Honor, it's Page 120 of 270. TexCom Exhibit 11, and now is labeled Denbury Exhibit 22.
Q (BY MR. RILEY) So I think you just told me that you found two persistent shale stratum?
MS. MENDOZA: Objection. I don't believe that was his testimony.
Q (BY MR. RILEY) Let's get your testimony clear.
A I didn't use the persistent. What I used the word was, "pure," or without sand or silt in it.
Q So there is some pure shale stratum based on your interpretation of the well log. Correct?

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A That's correct.
Q Where are they located? What depth?
A The best one is from 30 to 38.
Q Feet of depth?
A 6,030 to 6,038.
Q I thought you said 3238. That was my confusion.
A I'm sorry. Let me doublecheck that. No, I believe I said 30 to 38.
Q 6030 to 6038. Am I understanding you correctly?
A A foot.
Q Let me find that depth.
You made some marks on this yesterday. Is that correct?
A I did.
Q What is it about this log that tells you that that's a shale layer, or where do I look?
A What you look at -- the first thing to look at is the separation between resistivity curves.
Q That's the middle column?
A That's the middle column if you just move the depth track. So you see that the long dash, the short dash, and the solid line are all relatively tracking each other. They are all close to each other. There is

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no real separation between those curves.
That tells you that those curves -- that tells you that that section of the log is impenetrable by filtrate. There is no permeability or porosity there relative to the drilling fluid. You get an additional clue by looking at the washout as portrayed by the caliper. You see it there -- it's more washed out there.
Q Okay. You said there was another shale indicated -- shale layer indicated?
A Actually, there is two other little shale layers near the top that are relatively pure and have the same criteria.
Q Just go ahead and tell us the depth and extent of those shales in feet.
A The first little skinny shale you would portray as being relatively clean of sand and silt would start at 6007, and maybe go to 10 and a half.
Q So about 3.5-foot layer?
A Yes, sir. And then the next little skinny shale -- by using the same criteria we have just gone over -- would be roughly 13 to 16.
Q 6013 to 6016?
A Correct. Thank you for clarifying that.
Q And that's approximately three feet. Correct?

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A Yes, sir.
Q So in combination, then -- I'm sorry. Is there any other shale layers indicated in the well log in this area between the middle and upper Cockfield, which I understand you don't accept that terminology.
MS. MENDOZA: I'm sorry. You just said middle and upper Cockfield. Did you mean middle and lower?
Q (BY MR. RILEY) Sorry. Lower and middle Cockfield.
A By the criteria I was using, those would be the shale layers that would be clean and relatively free of any sand or silt.
JUDGE WALSTON: Mr. Riley, can we have him mark that on the exhibit?
MR. RILEY: That would be fine with me.
JUDGE WALSTON: Can you mark those?
MR. RILEY: Can we use a different color maybe?
JUDGE EGAN: I have hot pink.
WITNESS HERBER: That would be good because all I have is black with me.
JUDGE WALSTON: Just so we are clear, on Denbury Exhibit 22 where you are marking in pink would be these relatively pure shale layers you identified?

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MR. RILEY: Let me know when you are through, Mr. Herber, and I will return the markers.
WITNESS HERBER: See if this is acceptable, Counselor?
Q (BY MR. RILEY) Mr. Herber, I am going to show you what was provided in your disclosure as an article I think you relied upon in forming your testimony. Is that true?
MS. MENDOZA: Your Honor, if we can know what the witness is being shown.
Q (BY MR. RILEY) Sure. It's labeled in the bottom corner Bates label, as we call it, could you tell counsel what the label number is?
A Is that the DEN number?
Q Yes, sir.
A It's 4436.
Q So DEN4436. Correct?
A Yeah, and it goes through 4440.
MS. MENDOZA: Your Honor, may I approach the witness and take a look?
JUDGE WALSTON: You may.
Q (BY MR. RILEY) You have identified by Bates label -- is there a title on the document?
A It's the handbook of Texas online.
Q And even in the first couple of sentences, does

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the article refer to the upper Cockfield?
A Yes.
Q Thank you. Let me show you what's Bates labeled DENB 0063 through DENB 00106. I ask you if this is one of your other articles you relied upon. I flagged a couple of portions I would like to ask you about.
Is this something you relied upon in forming the basis of your testimony in this case?
A I did.
Q Did you have any difficulty finding the words "upper Cockfield" in that document?
A I don't have any problem finding that.
Q In fact, does it refer to upper, middle, and lower in that document?
A I guess I am not seeing the term "middle."
Q It refers to it as "intermediate." Is that correct.
A Like I said, I don't see the term "middle."
Q Let's look at the next page 00123. On 00122 you saw in italics -- it's a different article. It's a different page number. I'm sorry. There was a -- it's page 751 in the article.
Do you see that at the top of the page?
A I see a Page 751, yes, sir.

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Q I have a different Bates label that I am working from. But this is an article you reviewed and provided as part of your disclosures in this case. Is that correct?
A Correct.
MR. RILEY: Is there a reason Ms. Mendoza is hovering over the witness?
MS. MENDOZA: I'm sorry. I just don't have the document.
JUDGE WALSTON: She is just following along, which is acceptable. You can.
Q (BY MR. RILEY) Do you see in the middle of the page where it refers to producing sands. Correct?
A I do.
Q Do you see where it says -- beginning of the second full paragraph "upper Cockfield sand"? Do you see that, sir?
A I do.
Q Let's turn the page. Do you see what's now Page 752? Do you see where it says "intermediate sand"?
A Intermediate is not middle.
JUDGE WALSTON: Just answer his question.
Q (BY MR. RILEY) Do you see where it says "intermediate"? "Yes" or "no"?
A Yes, I do see that.

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Q Would you agree with me that two of the articles you relied upon in preparing for your testimony in this case referred to the upper Cockfield sand?
A That's not in dispute, Counselor.
Q We can go back over the record, but you said you didn't review any articles that referred to using nomenclature upper, middle or lower Cockfield.
A Not all three in conjunction.
Q Is that what you interpreted my question to be?
A Yes, sir.
Q So that's just a misunderstanding, then, between us that when I asked you a few moments ago whether any of the articles refer to upper, middle, and lower Cockfield, you understood me to mean all of those things?
A Simultaneously, yes, sir.
Q Let me clarify, then. Apparently you are parsing a little finer than I imagined.
MS. MENDOZA: Object to the sidebar.
JUDGE WALSTON: Avoid the sidebar, sir. We understand his testimony.
Q (BY MR. RILEY) In any of the articles that you reviewed, is there a reference to "upper Cockfield"?
A There are numerous because they are trying to distinguish between the main Conroe sands and the upper

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Cockfield sands, which are --
Q Sir --
JUDGE WALSTON: Just answer the question.
WITNESS HERBER: Yes, sir.
Q (BY MR. RILEY) You are saying that these articles that I have in my possession are trying to distinguish between the upper Cockfield sand from the Conroe sand? Is that what you are saying?
A They are.
Q Are they trying to distinguish within the Cockfield -- between sands in the Cockfield?
A They are trying to rate the difference between those sands that are at the actual top of the Cockfield defined by pale and shale color from the ones that are in the main field.
Q Sir, let's talk about the article by Frank W. Michaux -- M-I-C-H --
A That's the 1936 AAPG article that we've talked about.
Q Can I finish my question, sir?
A Yes, sir.
Q That's the bulletin of America Association of Petroleum Geologists, Volume 20, Number 6, June 1936, Pages 736 through 779. Correct?
MS. MENDOZA: Your Honor, if we are asking

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the witness to discuss a document, can counsel provide the document to witness?

JUDGE WALSTON: If he asks him specific questions, he will provide him the document.

MS. MENDOZA: He is asking him the page numbers.

MR. RILEY: May I?

A Thank you.

Q (BY MR. RILEY) Did I accurately describe the article reading from top of the document?

A Most concisely.

Q What is sloughing? In the context of a wellbore, what is sloughing?

A It's a slang term for when you are drilling the well that usually the shales, as a rule, will slide in.

Q Could you help us a little further. We are not geologists, so explain what you mean. What you have just described has to do with some phenomenon that one experiences or might experience in drilling through a shale layer. Correct?

A Yes, if your mud is not correctly engineered, you will have shale sloughing when you drill. So it's usually a phenomenon because the drilling mud is not correctly engineered. It's often seen by the caliper tool by those washouts.

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Q In other words, let's assume another set of facts here -- the well log that you have analyzed, the one interpretation might be that there has been sloughing in the well of the shale layers, and that might account for your interpretation of there being sands in the region between the lower and middle Cockfield. Is that correct?

A Yes, but the more common --

Q Sir, is that correct?

JUDGE WALSTON: Just answer the question.

A Yes.

MR. RILEY: I will approach the witness and reclaim my article, and I'll be ready to pass the witness.

I'll pass the witness.

JUDGE WALSTON: Does Executive Director have questions?

MS. GOSS: No questions, Your Honor.

JUDGE WALSTON: Any further redirect?

MS. MENDOZA: Yes, I do have additional redirect.

REDIRECT EXAMINATION

BY MS. MENDOZA:

Q Mr. Herber, when we look back at the -- or when we think back about the articles that TexCom counsel

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showed you during your examination, by any chance do you happen to have those two articles here with you?

A I do.

Q Do you need to get them if I am going to ask you questions about them, or can you do them from, perhaps, memory?

A Let's see what your questions are and go from there.

Q In that last article, the 1936 AAPG, what were they referring to when they talked about the upper Cockfield?

A They were talking about the sands that were separated by, basically, 150 foot of shale above the main Conroe sands.

Q If you happen to have TexCom Exhibit 102 there still on the table -- Mr. Herber, it's the map that looks like this with three different well logs on it.

JUDGE EGAN: Which exhibit are you referring to?

MS. MENDOZA: I am referring to TexCom Exhibit 102.

Q (BY MS. MENDOZA) If you take a look back at TexCom Exhibit 102 and take a look at the AAPG article that Mr. Riley was referencing you to.

Can you tell me at what depth that article

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was referring to when they discussed the upper Cockfield?

A On which log, Counselor?

Q On the WDW315?

MR. RILEY: It didn't exist in the 1930s. I am misunderstanding counsel's question, apparently. There is an article from 1930, and there is a well from 1999.

Q (BY MS. MENDOZA) Are you able to determine what the correlative equivalent is in WDW315 that they were referring to in the 1936 log?

A I can make that correlation.

Q Are you able now to tell us in approximate terms on the WDW315 log what the 1936 article was referring to when it spoke to the upper Cockfield?

A On the top of the Cockfield in their well would be roughly 4888 to 90 -- somewhere in there. This scale is hard to tell exactly.

Q On WDW315 when that article referred to the upper Cockfield, that's not the same upper Cockfield that TexCom is using. Is that correct?

A TexCom is not the same. They are dividing the rest of the Cockfield.

JUDGE WALSTON: Confine your answer as best you can.

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Q (BY MS. MENDOZA) So TexCom's upper Cockfield is somewhere essentially completely different than the AAPG article's use of the upper Cockfield?
A Yes.
Q Now, when the AAPG article -- you used, I believe, the term "intermediate sands."
Can you identify, based upon the WDW315 log, what intermediate sands would be in that 1936 AAPG article?
A I would have to pull that article and read that little section. It would just take me a second.
MS. MENDOZA: If we can take a moment, we will get that article and we'll take a quick look. If you can pull that article, please.
(Witness complies)
Q (BY MS. MENDOZA) Do you have now your copy of the article that counsel for TexCom showed you as the 1936 AAPG article?
A I am flipping through it right now. Yes, ma'am.
Q Can you find the reference that counsel was referring you to as "intermediate sands"? I believe it may have been around -- maybe it was Page 751, if we are looking at the numbers on the top. I'm not sure.
A Yes, I know what the intermediate sand means

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now.
Q And that intermediate sand is that -- where is that in WDW315 approximately?
A The intermediate sands are stratigraphic, and they come and go. There is one representative of that in the TexCom well that's developed at roughly 4988 to 5000-feet measured depth.
Q So that reference in that article to an intermediate sand is not what TexCom would call the middle Cockfield. Is that correct?
A No.
Q I'm sorry. Is that correct?
Is it correct that TexCom's middle Cockfield and the articles intermediate sands are different?
A They are completely different.
Q And just so we are also clear, because I think there continues to be some confusion over these upper Cockfield or the Cockfield sands that we are talking about. Those are higher than TexCom's proposed injection zone as it is shown on TexCom Exhibit 102. Is that correct?
A Yes.
Q And how much shale separates those upper Cockfield sands from the TexCom's proposed injection

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zone?
A From the top of the injection zone, just eyeballing on this one-inch correlation log, it's roughly 130 feet -- just rough, round numbers.
Q And my understanding from your earlier testimony is those upper sands produced about 160 percent of their volume. Is that correct?
A That's correct.
Q And that indicated that those sands were in communication with other portions of this field to be able to produce more than their volumetric equivalent?
A That's correct.
Q You were asked some questions about sloughing of shales, and I believe you had discussed one possible interpretation, but could you discuss with us what your interpretation is from the log and how sloughing of shales either may or may not affect that?
A When you drill the well, the mud system is pretty much constant throughout the interval you are drilling, so the washout is a relative term.
What I was trying to point out in my earlier testimony is that the sands were being more competent wouldn't be as washed out.
In this particular TexCom well, the hole from the LAS files that I have, from the top of that

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logged interval as on their Exhibit 22 -- our Denbury Exhibit 22, is washed out from top to bottom.
In other words, it's larger than bit size. Okay. So on a relative basis, the shales would still be more washed out. In other words, the caliber would be larger, and the sands would be smaller.
Q In response to one of Mr. Riley's questions, I believe when you were talking and marking the hot pink areas on Denbury Exhibit 22, you talked about those being proximal shales?
A Yes.
Q Does the proximal shale mean it is a brittle shale?
A It means that it has different characteristics than distal shales like the Jackson.
Q In what way would those characteristics be different?
A We touched upon it as having different capillary entry pressures, which characterizes the sealing ability of that particular shale.
Q Does this shale have a high sealing ability or a low saling ability?
A It has a low sealing ability, and if I may I'd like to qualify that.
Q Why don't you explain to us what you mean "by

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low sealing ability."
A It doesn't stop fluids from migrating vertically. May I add something else?
Q Yes, please, Mr. Herber.
MR. RILEY: Objection. Can he answer the questions asked?
JUDGE WALSTON: Ask him another question.
MS. MENDOZA: I will ask a different question.
Q (BY MS. MENDOZA) Do you have any other comments, specifically to the sealing ability of the shale, that we have been discussing at the top of the lower Cockfield?
A Yes.
Q What would that comment be about its sealing ability?
A It's something that's probably easier to understand than all the numbers that we have been talking about. The oil and gas was generated at the Sparta and Wilcox level. Those rocks are deeper than the Cockfield. They are the ones directly below.
Through the 35-million-plus years -- the 39 million years, that oil migrated from those lower depths into the Cockfield. And this is on geologic time scale, but basically they went through a long tortuous

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path from the Wilcox all the way up to the Cockfield, and they stopped -- the hydrocarbons stopped at the first sealing shale, which was the Jackson.
Q So the sealing ability of the Jackson shale is different than the sealing ability of the shale at the top of the lower Cockfield. Correct?
A As demonstrated by the trapping of the hydrocarbons -- as demonstrated by where the hydrocarbons were trapped.
Q You had talked some about some analysis that you had performed on the porosities and permeabilities in the lower Cockfield. I wanted to talk about -- you had done this average porosity. When you said average porosity for the lower Cockfield, did you mean across the entire depth that TexCom defines as the lower Cockfield?
A I did.
Q Mr. Riley had pointed you to -- at some point during his exam -- TexCom Exhibit 11, Page 144 of 270. I believe that's the correct one. That is the permeability versus porosity plot. I think you may still have that here.
MS. MENDOZA: If I can approach?
Q (BY MS. MENDOZA) You talked about -- and there was a question about air versus fluid porosity, and I

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believe you had indicated that this was -- permeability -- I'm sorry.
This was permeability to air. Correct?
A That's what the measurement is, yes, ma'am.
Q And if we did permeability to fluid, would that change this plot some?
A It would.
Q And for any given porosity would it make the correlated permeability to fluid, in general, a lower number?
A It would.
Q In your testimony yesterday, there was something that as best I can determine was discussing the geologic suitability of site, and you were talking some about the upper Cockfield -- not the upper Cockfield -- the Jackson shale. And I want to make sure that I understood your testimony was purely in a geologic sense. Is that correct?
A The hypothetical that Mr. Riley outlined was pertaining only to the geology.
Q You didn't include in that -- you weren't including in your analysis any artificial penetrations, were you?
MR. RILEY: Objection, leading.
JUDGE WALSTON: That is leading.

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Q (BY MS. MENDOZA) Were you including any analysis, in your responses to Mr. Riley, of things other than geology?
A No.
Q Were you including any analysis of the artificial penetrations?
A No.
Q Were you including any analysis of well construction?
A No.
Q Were you including any analysis of operational issues for a well?
A No.
MS. MENDOZA: If I can have a moment, I think I'm done.
Your Honor, we pass the witness.
JUDGE WALSTON: Lone Star?
MR. HILL: No questions, Your Honor.
JUDGE WALSTON: Individual Protestants?
MR. FORSBERG: Just a couple of quick questions, Your Honor.
CROSS-EXAMINATION
BY MR. FORSBERG:
Q Ms. Mendoza just asked you a few questions about the basis for some of your testimony yesterday.

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Correct?
A Yes.
Q When you say that you had not included well -- the well structure, in your opinion, are you referring to -- I believe a statement where you said something to the effect that the proposed site would be perfect but for the -- for the well -- for the injection well but for Denbury's operations?
A I did. That was part of the hypothetical constructed.
Q So when you said that, you were -- are you saying now that when you said that it would be perfect but for Denbury operations, that that's only in regards to the shale layer and nothing else?
A If I remembered yesterday, I was trying to state that the thousand feet of shale on either side of the Cockfield would keep the confluent within the Cockfield.
My testimony has been basically the same. Once the fluid is injected anywhere in the Cockfield, it will be anywhere in the Cockfield. It was a purely geologic answer. There was no implication the question also was to --
JUDGE WALSTON: You are getting well beyond his question now.

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Q (BY MR. FORSBERG) I just want to be real clear.
When you testified that the site was a perfect site but for Denbury's operations, you were looking at a very narrow issue in regards to geology and nothing in regards to public interest factors or other things that we have been talking about in this case?
A That's correct.
MR. FORSBERG: Pass the witness, Your Honor.
JUDGE WALSTON: Mr. Walker?
MR. WALKER: No questions, Your Honor.
JUDGE WALSTON: Public Interest Counsel?
MR. HUMPHREY: No questions, Your Honor.
JUDGE WALSTON: Mr. Riley?
MR. RILEY: Just a few.
RECROSS-EXAMINATION
BY MR. RILEY:
Q You relied on the chart, as I recall it, for lack of a better term. Ms. Mendoza referred you to it in the OMNI lab report. Correct?
A One of several charts I used.
Q But in the context of the re-redirect examination, Ms. Mendoza called your attention to a particular chart. Correct?

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A She did.
Q Give us, again, the exhibit number and page number, if you would.
A It's TexCom Exhibit 11, Page 144 of 270.
Q Flip a couple of more pages, would you? Is there some fluid permeability evaluation that was done by OMNI as it pertained to the core samples?
MS. MENDOZA: Your Honor, we are getting beyond the scope of my re-redirect. I can find it exactly to the one page that Mr. Riley had asked him about. He has had plenty of questions from Mr. Herber on this. I did not venture any further into the core report.
MR. RILEY: Of course not. But he asked about air permeability and fluid permeability and would the numbers be less. We actually have numbers. So that's where I was going.
JUDGE WALSTON: I'll overrule the objection, but can you refer us to a specific page?
MR. RILEY: I just don't have it in front of me, but I think --
Q (BY MR. RILEY) Mr. Herber, can you find where the lab tested permeability of the core samples as it pertained to fluid?
A I am missing it. Maybe somebody can help me

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here.
MR. RILEY: Can Mr. Lee approach the witness and find the page?
JUDGE WALSTON: Yes.
Q (BY MR. RILEY) Did you find it?
A Mr. Lee has pointed it out to me. Thank you.
Q What page are you referring to now, sir?
A The first page is 150 out of 270.
Q And are there actual permeability numbers calculated for the samples that were examined by OMNI labs outside of a contested matter? "Yes" or "no"?
A The conditions are different.
Q Sir, are there permeability numbers in that document you rely upon?
A Yes, there are.
Q And those were permeabilities determined by OMNI Labs for the samples as it pertains to fluid. Correct?
A Yes.
Q Thank you.
A But there is --
Q Sir --
JUDGE WALSTON: Just answer the question. Mr. Riley, tone your voice down.
MR. RILEY: I'm sorry.

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Q (BY MR. RILEY) So I am understanding now that your testimony is that the location in a geologic sense proposed for TexCom well is perfect. Correct?
A I have had a chance to reflect on that answer.
Q I'm sure you have. Was that your testimony yesterday?
A That was my testimony yesterday.
Q In fact, in May of this year -- on May 20, 2010 I asked you the following question, and you gave the following answer. See if you recall it.
MS. MENDOZA: Your Honor, I am going to ask that --
MR. RILEY: I'm sorry. I was just about to give that to you, Counsel.
Q (BY MR. RILEY) Deposition of Jon Herber, Page 93, Line 9 is the question, and the answer begins on Line 13.
QUESTION: "And is there any, as a geologist, would you think absent our circumstances for being here today in this case, would you think that waste disposal into the Cockfield is appropriate with the Jackson shale as a protective layer?"
Line 13, ANSWER: "The -- the -- the waste material that's put into the Cockfield in this setting could stay in the Cockfield, in my opinion."

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Is that correct?
A I'm being consistent.
Q Sir, is that correct?
A Yes, that's correct.
Q Thank you. Sir, are you able to do reservoir modeling?
A No, sir.
Q You provided certain information to a reservoir modeler in this case, I believe Mr. Fairchild. Is that correct?
MS. MENDOZA: Your Honor, I am not seeing how this is connected in any way to my redirect.
MR. RILEY: I'll connect in just a second.
JUDGE WALSTON: It does seem to be going beyond the scope of her re-redirect, but. . .
Q (BY MR. RILEY) Is that correct, sir, to provide geologic information to other witnesses in this case testifying on behalf of Denbury?
A I did.
Q An issue exists, and this will connect to your testimony a moment ago, regarding the sealing ability of the shale layer. That's where I am headed.
Your testimony is there is no sealing ability in the Cockfield formation, the area of WDW410. Correct?

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A That's my testimony, sir.
Q So any modeling that might be done should take into account your geologic testimony. Is that correct?
A Modeling is an iterative process. You start with your simple model and you work your way and introduce geologic complexity as you get the basic model done.
Q But you would hope that the modeling would reflect your interpretation of geology, wouldn't you?
A That's the ultimate goal.
Q Thank you.
MR. RILEY: No further questions.
JUDGE WALSTON: Executive Director?
MS. GOSS: No questions, Your Honor.
JUDGE WALSTON: Ms. Mendoza, I hope we are at an end, but do you have anything?
MS. MENDOZA: I think we are. I think I'm just --
FURTHER REDIRECT EXAMINATION
BY MS. MENDOZA:
Q Mr. Herber, turn back to TexCom Exhibit 11, Page 150. Let's start with the first page that Mr. -- that we started with here. TexCom Exhibit -- Page 146, TexCom Exhibit 11, Page 146.
Let's look at the sample. It's sample

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number 3 at 6077.55 feet. The permeability to air was 554 millidarcies. Is that correct?
A At 2000 psi. That's correct.
Q Can you flip over to Page 153 of TexCom Exhibit 11. And do you see at the top where it says sample depth feet 6077.55. Does that lead you to believe this is from the same sample?
A Yes.
Q And can you tell me, are the numbers in the column that is apparent permeability to liquid, are those numbers higher or are they lower?
A They are lower.
MR. RILEY: Objection. To what?
Q (BY MS. MENDOZA) Higher or lower than their permeability to air?
A They are lower.
MS. MENDOZA: No further questions.
JUDGE WALSTON: Anybody else?
Thank you, Mr. Herber.
MR. RILEY: Just a couple of questions on that last one.
JUDGE WALSTON: I didn't think you had any.
MR. RILEY: I'm sorry.

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FURTHER RECROSS-EXAMINATION

BY MR. RILEY:

Q When you said the sample was the same, the same as what? What are you referring to? What correlation are you drawing in response to Ms. Mendoza?

A When you take a whole core, which is what TexCom did, it has a 4-inch diameter, and under the direction of Crossroads, they took plugs to test.

Q So you said to Ms. Mendoza -- you must have understood her question. Right?

A Yeah.

Q These are the same.

A So when the --

Q Sir, precisely as you can --

A They are the same based on the depth. You can't take a plug twice.

JUDGE WALSTON: Let Mr. Riley get his question out.

Q (BY MR. RILEY) When you said something was "the same" just a moment ago to Ms. Mendoza, what precisely were you referring to?

A They are the same plug.

Q What pages, then, should I look for the results from the same plug?

A Let's just take the Page 150 for the sake of

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convenience.

JUDGE WALSTON: Confine it to the questions Ms. Mendoza asked you. I think she started off on Page 146. Correct?

WITNESS HERBER: Yes.

JUDGE WALSTON: She referred to 6077.55?

WITNESS HERBER: Yes.

JUDGE WALSTON: That's what you correlated?

WITNESS HERBER: Yes.

JUDGE WALSTON: To which page did it correlate it to?

WITNESS HERBER: It was Page 153.

MR. RILEY: That's all I was asking, Judge. That's all I needed.

JUDGE WALSTON: That's all your questions?

MR. RILEY: Yes, sir.

JUDGE WALSTON: Thank you, Mr. Herber.

Next we have Mr. Fairchild?

MS. MENDOZA: Yes, Your Honor.

MR. WALKER: Your Honor, I had discussed with other counsel the possibility of taking Ms. Karen Baker out of order. Mr. Riley had previously suggested that if we do that he was willing to offer her deposition as his cross-examination.

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If that is still the case, I would agree with that so she can go about her duties if other counsel do not care to cross-examine.

MR. RILEY: Let me just amplify that a little bit. Last evening we sent an email giving what we all know now about our schedule. We sent an email that we would substitute the deposition for live cross-examination if Ms. Baker needed to go on about her duties. We did not -- other than Mr. Hill -- we didn't receive a response to that email.

So I am comfortable making that deal now and substituting cross-examination or substituting the deposition as our cross-examination of Ms. Baker. But it is contingent on all -- if folks agree, because I have been caught in this snare before, and I'd rather not get caught there.

MS. MENDOZA: I have no cross-examination questions for her.

JUDGE WALSTON: Mr. Hill?

MR. HILL: I agree.

JUDGE WALSTON: Mr. Forsberg?

MR. FORSBERG: I agree.

MR. REDMOND: I agree as well.

JUDGE WALSTON: ED?

MS. GOSS: ED will not object.

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JUDGE WALSTON: As far as the TexCom exhibit --

MR. RILEY: I think it's 104 where we need to be. TexCom Exhibit 104, which is the -- it's been distributed to the parties and I think copies have been given to you and I'd offer into the record as our cross-examination of Ms. Baker.

(Exhibit TexCom Exhibit 104 marked)

JUDGE WALSTON: Is Ms. Baker here?

MR. WALKER: She is here, Your Honor.

JUDGE WALSTON: Is she going to have any changes or corrections to her testimony?

MR. WALKER: I do not believe so, Your Honor.

JUDGE WALSTON: Ms. Baker, let's go ahead and get you in -- where is Ms. Baker?

MS. MENDOZA: Your Honor, can I ask about the scheduling -- I have taken very poor notes yesterday.

Are we planning on the typical hour lunch break, or are we doing something shorter?

JUDGE WALSTON: We didn't really discuss it.

MS. MENDOZA: I think we are going to have a full day, so maybe an hour would be appropriate.

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JUDGE WALSTON: I would prefer an hour. We'll see how we get through the rest of the morning.

Would you state your full name for the record.

WITNESS BAKER: Karen Baker.

PRESENTATION ON BEHALF OF THE ALIGNED PROTESTANTS

KAREN BAKER,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. WALKER:

Q Ms. Baker, if you would look in front of you there I think you might see Exhibits 1, 2, 3 and 4.

Do you see that?

A Yes, sir.

Q Do you recognize Exhibit 1 as your prefiled testimony in this matter?

A Yes, sir.

Q Can you recognize Exhibit 2 as the Texas Department of Transportation Access Management Manual, December 2009 Edition?

A Yes, sir.

Q Do you recognize Exhibits 3 and 4 as respectively TexCom Exhibit 6, Page 201 out of 314, and TexCom Exhibit 6, Page 198 of 314?

A Yes, sir.

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Q Ms. Baker, with respect to your prefiled testimony and those exhibits, do you adopt them today presently as if you were to give that testimony today live in this hearing?

A Yes, sir.

MR. WALKER: Your Honor, with that, I will offer into that Aligned Protestant's Exhibits 1, 2, 3 and 4 and pass the witness.

JUDGE WALSTON: Aligned Protestant's Exhibits 1, 2, 3, 4 are admitted.

(Exhibit Aligned Protestant Nos. 1-4 admitted)

MR. RILEY: Judge, I have one -- Aligned Protestant's Exhibit 2 is missing a page -- last page, which we have copied from the actual manual and we have available for the other parties. Just so the exhibit is complete. I am sure it was inadvertent on counsel's part not to have copied the last page, but here it is for everybody's edification.

JUDGE WALSTON: Is there any objection to adding Page 311 to --

MR. WALKER: Your Honor, I have no objection. I apologize for leaving that out.

MR. RILEY: As I said --

JUDGE WALSTON: It's understandable. I'm sure it was inadvertent.

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JUDGE WALSTON: Is it agreeable that the parties can add that to the current exhibit, or do we need to mark that as a separate?

MR. WALKER: I think it would be fine just to add it. It's the last page of the manual, Your Honor.

JUDGE WALSTON: So Ms. Baker, can you insert that into the exhibit?

WITNESS BAKER: Yes, sir.

JUDGE WALSTON: We had a previous discussion, as I understand, all the parties have agreed to waive cross-examination except that TexCom Exhibit 104, which is the oral the deposition of Karen Baker, March 16, 2010, will be substituted for TexCom's cross-examination.

MR. RILEY: Yes, sir.

JUDGE WALSTON: Are there any objections to TexCom Exhibit 104?

(no answer)

JUDGE WALSTON: There being none, TexCom Exhibit 104 is admitted.

(Exhibit TexCom No. 104 admitted)

JUDGE WALSTON: With that, Ms. Baker, thank you for being here. You can be excused.

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MR. WALKER: Your Honor, I certainly thank counsel present and all parties for their indulgence in this matter.

JUDGE WALSTON: Mr. Fairchild, step up to the microphone.

(Witness sworn)

JUDGE WALSTON: State you full name for the record.

WITNESS FAIRCHILD: James Wadsworth Fairchild.

JUDGE WALSTON: Be sure and pull that microphone right up to you and speak good and loud.

MR. RILEY: Judge, I'm sorry. I'm very warm. Is anybody else warm?

JUDGE WALSTON: You can take off your jacket.

MR. RILEY: Would you mind?

JUDGE WALSTON: No, that's fine.

Ms. Mendoza?

PRESENTATION ON BEHALF OF DENBURY ONSHORE, LLC

(CONTINUED)

JAMES FAIRCHILD,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MS MENDOZA:

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Q Mr. Fairchild, do you have in front of you a notebook with Exhibits 4 through 12 in it? If you could turn to Tab 4 and look at Exhibits 4 through 12, and then identify those for us.
A Yes, I do, 4 through 12.
Q Are those exhibits your prefiled testimony in this case?
A That is my direct testimony, yes.
Q Since the time you have prepared Denbury Exhibits 4 through 12, have you had the opportunity to review the exhibits for any corrections that need to be made?
A Yes, I have.
Q And do you have some corrections to Exhibits 4 through 12?
A Yes, two minor corrections.
Q Can you point to us the page and the line number for those?
A Page 7, Line 7.
Q Can you tell us what the correction is?
A Yes, there is a word "this" on the fourth word from the end of Line 7, and it should be a "the."
Q And then do you have another correction?
A Yes, on Page 9, Line 23, the second word "in" changed to "by," B-y.

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MR. RILEY: Sorry. I didn't follow that one, if you could help me.
WITNESS FAIRCHILD: Page 9, Line 23, the second word is "in," I-n, change that to "by," B-y.
MR. RILEY: Thank you.
Q (BY MS. MENDOZA) With those two corrections, do you adopt Exhibit 4-12 as your testimony, just as though you had given your testimony live here under oath?
A I do.
MS. MENDOZA: Denbury offers Exhibits 4 through 12.
JUDGE WALSTON: Denbury Exhibits 4 through 12 are admitted.
(Exhibit Denbury Nos. 4-12 admitted)
JUDGE WALSTON: Lone Star?
MR. HILL: No questions at this time, Your Honor.
JUDGE WALSTON: Individual Protestants?
MR. FORSBERG: No questions at this time, Your Honor.
JUDGE WALSTON: Aligned Protestants?
MR. WALKER: No questions, Your Honor.
JUDGE WALSTON: Public Interest Counsel?
MR. HUMPHREY: I have no questions, Your Honor.
JUDGE WALSTON: TexCom?
MR. RILEY: Yes, sir.

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CROSS-EXAMINATION

BY MR. RILEY:
Q Mr. Fairchild, could you describe your firm in terms of number of personnel working for your firm?
A Currently there are three employees.
Q Does that include yourself or three other employees?
A I'm included as one of the employees.
Q So it's not a long list, then? What's the name of your business?
A Fairchild and Wells, Inc.; Fairchild & Stan, DBA.
Q What was the DBA? I'm sorry. I didn't catch it.
A Fairchild & Stan -- that's an ampersand; and Fairchild and Wells is A-N-D.
Q Who else is employed by Fairchild and Wells, Inc.?
A Peter Stan is an engineer that works for me, and Jennifer Bowling is our office assistant/bookkeeper.
Q Did Mr. Stan assist you in preparing your testimony in this case?

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A No.
Q Did anyone in your firm assist you in preparing your testimony in this case?
A Maybe I should change that last answer. I discussed a couple of issues with Mr. Stan. He did not directly help me prepare the testimony.
Q So is it safe to assume, then, that all of the work done in this case leading to your testimony here this morning was done by you? Correct?
A Not entirely.
Q Other than the exception -- within your firm, you are the only person in your firm, other than what you have already described as Mr. Stan's participation, you don't have a staff to rely upon. Correct?
A That's correct.
Q You did some modeling in this case. Correct?
A Reservoir modeling, yes, that's correct.
Q But this is not the first time your firm has been retained in relationship to WDW315 or now referred to as WDW410. Is that correct?
A That's correct.
Q What was -- when was your firm engaged by some other party or some other entity to do an evaluation of WDW315 as it was known then?
A That would have been in December of 1999.

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Q What was your firm retained to do in December of 1999?
A Do an evaluation of the 1999 fall-off test.
Q Did you perform that evaluation, or did someone with your firm perform it?
A Mr. Stan performed it.
Q How long have you had a professional relationship with Mr. Stan?
A He's been an employee upward of 20 years.
Q As a result of the analysis performed by Mr. Stan, did your firm offer an opinion as to the permeability -- average permeability in a perforated interval in the lower Cockfield formation for Crossroads -- I believe was the owner of the well at that time?
A We did not do the work for Crossroads.
Q You did not do the work for Crossroads. Did you do it for some other entity?
A The letter that's in the TexCom documents was addressed to a Mr. Tom Roth.
Q Mr. Roth was with what entity as far as you know?
A I think he was independent.
Q With that qualification, did you know that Crossroads was the entity that owned the well at the

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time?
A I actually don't recall.
Q Have you reviewed any information that refreshes your recollection as to who the owner of the well was in 1999?
A I don't think I have any documents in our files that we have retained that shows Crossroads as the owner of that well.
Q Am I understanding correctly you don't know who you did the work for but you did some work in 1999?
A We did the work for Mr. Roth.
Q Mr. Roth? Okay. And you provided Mr. Roth with some analysis of a fall-off test. Is that correct?
A We did.
Q And in your analysis -- meaning your firm's analysis -- what was the permeability you determined from evaluation of that fall-off test?
A Based on the parameters that we used, we determined a permeability at 80.9 millidarcies.
Q Mr. Fairchild, as part of this case you did some modeling -- is that correct -- reservoir modeling.
A I did.
Q When I refer to "modeling" in this context, please understand me to mean "reservoir modeling." Okay?

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A Okay.
Q And your starting point was to evaluate the model that was used by the Applicant in this matter and his consultant, Mr. Casey, called BOAST98. Is that your understanding?
A Correct.
Q And you had a different model -- is that correct -- different software, different program. Is that correct?
A I used a different software platform, yes.
Q The software platform you used is what?
A VIP.
Q Like very important person, VIP?
A Vector Implicit Program.
Q Your firm has prepared Class I nonhazardous injection well permit applications in the past. Has it not?
A We have.
Q And as a result, are you familiar with the underground injection control program administered by the Texas Commission on Environmental Quality.
A I have never used it, no. I'm basically familiar with what they have, but I've never used it.
Q I'm sorry. I'm not talking about the program. I am talking about the program in the sense of -- the

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way we refer to it -- there is a permitting function.
A Yes, I am basically familiar with the permitting process under the TCEQ.
Q Let's call it the "regulatory process" so we don't get confused with "program." Is that okay?
A Okay.
Q So tell me your experience -- your direct experience, not someone else's -- direct experience with the regulatory process that's involved in this case -- the UIC permit process.
MS. MENDOZA: I'm sorry. I'm not sure I understand the question. Were you asking him to tell us all the rules, or are we being asked for him to talk about something different?
MR. RILEY: I was going to ask him to tell us all that he knows about the UIC program. That's the extent of our -- by UIC, the regulatory process. That's the extent of my question.
JUDGE WALSTON: Do you understand the question?
WITNESS FAIRCHILD: Not really.
Q (BY MR. RILEY) I'll try to set it up better.
As I understand your resume, you give, I suppose, relevant work experience. Is that correct?
A I believe so.

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Q And on page -- the pages aren't numbered, but somewhere in here you have a section entitled, Class I Injection Well USEPA No Migration Petition Reissues.
Do you see that? That's Page 4 at the top of the page. This is Denbury Exhibit 5.
A Yes, I see that.
Q And do you see where it says, "State Permit Applications"?
A I do.
Q Am I correct that those are permit applications that you or your firm has prepared on behalf of the clients listed and for the type of well listed in the fourth column?
A Correct.
Q It would also reflect the dates in which your firm prepared those applications. Correct?
A Correct.
Q Did you participate in preparation of those applications?
A I supervised all of those.
Q Your supervision would have then been of Mr. Stan. Is that correct?
A That's correct.
Q Was he the only other person that participated in preparation of those applications?

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A I think that's correct.
Q At least one of -- I'm sorry -- let me check that. One of the --
A I should change that. Other than my participation?
Q Yes, sir.
A I think that's correct.
Q As between you and Mr. Stan, that's the -- those are the people who prepared those applications?
A I believe so.
Q In those applications, did you perform any modeling analysis similar to the type you performed in preparation for your testimony in this case?
A We would have done a finite difference model in the James Hardie --
Q Is that the only --
A -- under --
Q I'm sorry. I didn't mean to cut you off.
A Under the state permits, I think that's correct.
Q We'll get the difference between finite difference and other types of modeling in a moment.
But did you perform modeling in the Occidental Chemical Corporation application of any type?
A Are you saying finite difference or just any

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modeling?
Q Any reservoir modeling, if that helps you.
A Can you define reservoir modeling?
Q It's part of a permit application in the UIC program. The State requires some modeling. Is that true?
A That's true.
Q So in that context, did you meet the State specifications and requirements in preparing those applications?
A We did.
Q So then is it safe to conclude that you performed modeling for those applications?
A Yes.
Q So running down the list now, if I went and pulled the file for the Occidental Chemical Corporation, a site in Corpus Christi, the date of the application appears to be 1996. It was a Class I hazardous well. Your firm, or you, would have performed modeling in that case. Correct?
A Correct.
Q I can do each one, but if I asked you the same question for each of the items listed here, at least up to the Carrizo Oil application, which is Class II, you would have performed modeling in each of those

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applications. Correct?
A Correct.
Q A moment ago you wanted to tell us about finite difference modeling. Is that right?
A Yes.
Q You mentioned finite difference modeling, and you were drawing a distinction.
A Right.
Q Finite difference model is what type of model?
A It's a mathematical solution to the continuity and diffusivity equation.
Q Am I correct that VIP is a finite difference model?
A You're correct.
Q Am I also correct that BOAST is a finite difference model?
A Correct.
Q Are there other types of modeling functions that have been performed, then, in the application work you have done or your firm has done?
A You mean types of software?
Q Yes, sir.
A In the BASF Corporation in Geismar, Louisiana, which was the no migration petition, we would have used SWIFT, and we had a third party, I believe, do that

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modeling for us.
Q We established that you did modeling in each of these applications. Correct?
A Yes.
Q You explained that you did finite difference modeling in the -- let me rely on my memory here -- the James Hardie application. Is that correct?
A We did.
Q And you have explained that in the -- am I remembering correctly -- in the BASF Corporation application, you used a different program called SWIFT?
A There is two BASF. Which one are you referring to?
Q I'm sorry. Well, you tell me so I don't mess it up.
A The one which is listed first in that -- on Page 4 -- we would have used SWIFT.
Q So I am going to make a note here so I don't get confused. That's the chart above the one I was discussing, which is State Permit Applications, you used SWIFT in the BASF Class I Injection Well No Migration Petition. Correct?
A That's correct.
Q I wasn't really asking about that table, but now we have that clear.

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On the second table -- I am going to make another notation -- on James Hardie, a Class I nonhazardous well, as I understood your testimony so far, you used VIP. Correct?
A No.
Q I'm sorry. I misunderstood. Please explain.
A On James Hardie we did two different types of modeling. We did the analytical modeling, and we also did a finite difference modeling using a product called SIM.GALIS.
JUDGE EGAN: What was the model again?
WITNESS FAIRCHILD: SIM.GALIS, S-I-M-G-A-L-I-S.
Q (BY MR. RILEY) What is an analytical model?
A I'm not sure I have a good description. It's solving a mathematical equation with what I would call a direct solution as compared to a finite difference solution.
Q What model did you use in your analytical modeling in the James Hardie application?
A We would have used a product called Pie, P-I-E.
Q Are you familiar with a model or a product called PRESS2?
A I'm aware of it.
Q Is that an analytical model?

1192

A I believe so.
Q Do you know how it compares to PIE?
A Not directly, no.
Q Is PIE a proprietary software or model?
A It's not freeware, correct.
Q In the Occidental Chemical Corporation, Class I hazardous well permit application, 1996, what model did you use?
A We would have done an analytical solution.
Q What model did you use?
A I'm not sure that I recall the specific software.
Q Moving forward, the Chevron Chemical Company application in Belle Chase, Louisiana, 1996, did you do -- what model -- did you use an analytical model?
A We did.
Q Do you know what model you used?
A We would have used the equation of Matthews and Russell, which is an analytical solution that is, I guess, recommended -- for an analytical model, that is accepted by the State of Louisiana.
Q Lyondell Petrochemical Company in Channelview, Texas, Class I hazardous well in 1998, did you do an analytical model?
A That was analytical.

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Q What model did you use?
A Right off the top of my head, I don't recall.
Q The second BASF application, Geismar, Louisiana, 2002, did you do an analytical model?
A For the BASF Corporation in Geismar, Louisiana, we used the Matthews and Russell -- the same as we did for the Chevron Chemical.
Q Just to be complete, the Carrizo Oil and Gas, Incorporated, Anderson County application, 2008, did you do any modeling for the Class II application?
A For Carrizo Oil and Gas, we did an analytical.
Q Do you know what model you used?
A PIE.
Q In this case, Mr. Fairchild, as we have just discussed a moment ago, you used a modeling or model program -- a finite difference model called VIP. Correct?
A Correct.
Q Is that freeware?
A No.
Q Is BOAST freeware, as far as you know?
A At one time there was a version of BOAST that was freeware. There are more than -- I think there is more than one release or version of BOAST.
Q You have been working or doing work for

1194

Crossroads for some number of years -- correct -- Crossroad -- I apologize -- for Denbury for some number of years. Is that correct?

A About two and a half.

Q So you are not -- you weren't retained in this matter specifically for this case -- let me try that again.

You had a relationship with Denbury -- a business relationship with Denbury prior to the inception of Denbury's participation in this case. Is that true?

A Yes, I think it started in November of 2007.

Q What type of work were you doing with Denbury prior to your involvement in this case?

A Modeling -- reservoir modeling.

Q And for what fields in particular, if that's a fair question? I assume that reservoir modeling was for certain reservoirs. Is that true?

A Yes, these were all CO2 related.

Q What fields in particular have you been engaged by Denbury to model?

A I have modeled Conroe, Midway, West Heidelberg --

JUDGE EGAN: West what?

WITNESS FAIRCHILD: West Heidelberg,

1195

H-E-I-D-E-L-B-E-R-G.

A And Hastings. Those were the major -- or actually, West Hastings, I believe it is.

Q You mentioned Conroe. Is that the modeling you have introduced in your prefiled testimony?

A No.

Q You have done other modeling at the Conroe Field that you have not produced. Is that correct?

A I have done some pattern models for the Conroe Field.

Q Do you know if you have produced that information?

A I don't believe so.

Q When did you do those models?

A A couple of years ago.

Q On behalf of Denbury a couple of years ago?

A Yes.

Q So Denbury has been the owner of the field since December of 2009. Is that correct?

A I believe so.

Q But it was involved in the field or seemed interested in the field to have you model it as long as two years ago. Is that right?

A Yes.

Q What modeling did you specifically perform for

1196

Denbury a couple of years ago related to the Conroe Field?

A My recollection is that we used an 80-acre model and 160-acre model of the, what we call, the A1 through A5 sands.

Q A1 through A5 sands?

A Right. I believe one of them -- and I do not recall which one was the 160 and which one was the 80 -- but the A1, A2 was modeled with one of those patterns, and the A2, A5 with the other pattern.

Q When you say "pattern," I'm not sure what you are referring to. So what pattern -- what do you mean when you say "pattern"?

A We modeled as an inverted nine-spot pattern, and we modeled as an inverted five-spot pattern.

Q I think I know what you mean, but when Mr. Lee gets back, I'll see if I can clarify it. You are talking about well -- CO2 injection well placement. Correct?

A No.

Q You're not? I'm sorry.

A It would be referred to more as a mechanistic model.

Q Mechanistic model? But you talked about a pattern. In a pattern of what?

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A Pattern of wells.

Q Pattern of wells.

A In the nine-spot pattern, in effect, we're modeling one injector and effective three producers.

Q So I'm sure I have mischaracterized it and said it incorrectly. You are talking about a pattern of wells around a producing well. Correct?

A Not a given producing well, but yes, a mechanistic around a producing well.

Q It may be multiple wells in this pattern, but, I guess, my understanding is a nine-well pattern and five-well pattern? Is that right? That's what you referred to a moment ago?

A Right. In the nine-well case, we would have had one injector and an effective three producers.

Q Okay.

MR. RILEY: Can I have Mr. Moore put something up on the easel? Would you allow me to do that? It actually is an exhibit -- Denbury Exhibit 20 is the number.

MS. MENDOZA: I'm sorry. Which number?

MR. RILEY: Denbury Exhibit 20.

MS. MENDOZA: Thank you.

Q (BY MR. RILEY) Am I correct, Mr. Fairchild, that what's depicted in Denbury Exhibit 20 is the Conroe

1198

Unit? Is that correct? In the outline around the dots in the middle, is that the Conroe Unit as you understand it?

A I think this is the first time I have seen that particular exhibit.

Q That's fine.

Can you take a closer look, then, to Denbury's exhibit, and you haven't seen it before, so take a moment, examine it, the key, the lot, whatever information is on the exhibit and tell me what you think it is.

A It appears to have well locations for the Conroe Field, along the outside there is a stair-step boundary, which according to the legend, would be the Conroe Field Unit, and there are wells noted in there as planned producers and planned injectors -- different symbols.

Q I know this has been sprung on you, apparently this morning, but can you tell me whether that -- the patterns you have been referring to are depicted in that exhibit?

A It's not there.

Q So is there a pattern to the exhibit that is helpful for us for discussion purpose? In other words, is it a five-well, or six-well, or some other number

1199

well injection pattern?

A Without taking some time, I --

Q I have got lots of time. So why don't you take a look and see if you can discover that.

A Well, the right way to do this would be to take a Marks-A-Lot and mark it up and try to draw patterns and see what comes out.

Q Okay. So you can't do it?

A Well, I can do that, yes.

Q Please do it.

A Now that I get closer to that, it's already been done.

Q Now that you got close -- what? I couldn't hear you, sir.

A Well, getting closer to this -- the green dots are producers -- planned producers, the red or maybe the orange triangles are injectors, so this --

Q I'm not sure everyone can hear you. Can you keep your voice up a little bit, sir?

A So if we look at this -- if this is a producer, here are four injectors; if this is a producer, here are four injectors. So you have got a repeated pattern.

Q And the pattern is -- is it a four-well pattern, then?

A It would be a five-well. As far as the pattern

1200

is concerned, it's effectively a five-well.

Q So that's where the five comes from, you have got a producer and four injectors. Is that correct?

A Producer and four effectors -- the net effect of the injectors is one well.

Q That would be the producer? I'm sorry. The net effect of the five wells --

A You have got one producer, which is the green dot.

Q Okay.

A And if we would take where we have repeated patterns, let's say here (indicating), you have got an injector, but it's shared with three other patterns. So it's effectively a corner well. In this corner you would have a corner well, corner well, and a corner well.

So you have got one producer and net to that pattern, you have got one injector.

Q I understand. In your terminology you used a few minutes ago, is it fair to call that a five-well pattern?

A We can do that.

Q So you modeled for Denbury previously a five-well pattern -- correct -- for the Conroe Field?

A We had a mechanistic five-well pattern for -- I

1201

would have to look at my notes, but I think for the A1,A2 sand.

Q What was the input parameter for permeability in that model?

A I don't recall.

Q What was the input parameter for porosity in that model?

A I don't recall.

Q So you haven't reviewed that model in preparation for your testimony?

A No.

Q Did you provide the output, or the results of your modeling to Denbury in the work you described two years ago regarding the Conroe Field?

A I provided it in the form of spreadsheets, yes.

Q To whom did you provide that information?

A Reservoir engineer -- an acquisition engineer, Steve Upp.

Q What's the name again? I'm sorry.

A Steve Upp, U-p-p.

Q You described him as an acquisition engineer. I'm not familiar with that categorization of engineering. So tell me what an acquisition engineer is.

A He's a reservoir engineer in their acquisition

1202

department.
Q Would the information you provided to Mr. Upp contain input parameters for your modeling?
A Some of them, yes.
Q Some input parameters. Correct?
A I believe so.
Q Do you know whether that modeling was produced in this case?
A In what format?
Q To us -- to the Applicant in the case.
A But in what format?
Q I'm assuming in the format which you provided to Denbury was the spreadsheet you described.
A I do not know.
Q I am going to ask you whether -- your interpretation of the following sentence.
"Produce all documents related to Denbury's plans for CO2 enhanced oil recovery in the Conroe Field as described in its filing including, but not limited to, any applications for or issued authorizations."
Would you believe that covers the modeling you just discussed?
A I think that's a legal question.
Q It may be a legal question, but I am asking you

1203

as a human being whether you can hear those words, interpret them, and answer my question.
MS. MENDOZA: Objection. I think he has answered the question.
MR. RILEY: He has made a ruling of an objection that was never offered.
JUDGE WALSTON: I think it may call for a legal ruling, so I'll sustain the objection.
MR. RILEY: We'll have an application at the lunch hour.
Q (BY MR. RILEY) Let's look at your prefiled testimony on Page 9 -- in fact, the line that you corrected at the outset of your testimony.
A Okay.
Q The line, as I read it is, "This is a common error made by engineers performing reservoir simulation."
Did I read that correctly?
A With the change that we just made, yes.
Q It is your opinion, in this case, that the modeling done by Mr. Casey was incorrectly done. Correct?
A I disagree with some of the input that he gave to BOAST.
Q By "disagree," I know it seems uncomfortable

1204

for people, but do you think Mr. Casey did the modeling incorrectly? Is that correct?
A I think some of the data they provided and some of the methodology they used to provide is not correct.
Q You have described your differences with Mr. Casey's modeling in your prefiled testimony. Is that true?
A I believe so.
Q The line I just called your attention to is -- you talk about it's a common mistake, a common error for engineers to do something that Mr. Casey did. Is that right?
A Yes. On Line 22, 23, Page 9.
Q Yes, sir.
Is there -- we talked about this during your deposition. Is that correct?
A At length.
Q I asked you at that time if you had any support in the form of learned treatise, textbooks, something that supported your opinion that -- as it pertains to this answer that there was an error made in the TexCom modeling.
Do you recall those questions?
A I do.
Q At the time -- and I don't have your deposition

1205

open at that page right now -- but at that time, I don't recall you being able to provide me with any information in that regard. Is that true?
A I was not able to provide you with a specific published article.
Q I think we might have even said we would discuss this again at some point, and guess what, here we are.
Have you, since that time, discovered any article that would support your interpretation or your opinion in this regard?
A In my mind, yes.
Q In your mind, yes. So you have looked at something new between the time of your deposition and today. Is that true?
A Yes.
Q And you have provided that information to counsel. Is that true?
A I believe so.
Q That information has been provided to us as best you know?
A I guess.
Q Now, since it's a common error that you refer to, would you say that there is disagreement in the field on this point -- in the field of engineering --

1206

reservoir modeling?
MS. MENDOZA: With what point? That it's a common error?
MR. RILEY: Let me try to be more clear.
Q (BY MR. RILEY) You refer -- and I am not going to read you the whole answer -- but you explained that Mr. Casey made an error, and you explained that it's common for engineers performing reservoir modeling to make that error. Correct?
A I did.
Q With respect to the error that you say Mr. Casey committed, you say that's common in engineering in reservoir modeling.
A I have seen it more than once.
JUDGE EGAN: For my edification, are we talking about porosity?
MR. RILEY: Yes, ma'am.
Q (BY MR. RILEY) Is that -- could it be a difference of opinion in the field, sir, as opposed to an error on one side or the other?
A It could be open to a technical discussion.
Q A tactical discussion?
A Technical.
Q Technical. I'm sorry.
What is your highest level of education,

1207

sir?
A I have a masters degree in mechanical engineering.
Q A maters in chemical engineering?
A Mechanical.
Q Mechanical engineering.
In achieving your masters degree, did you write any thesis, or was that a requirement at the time?
A It was.
Q What was your thesis in?
A I'm not sure I can remember precisely. You are taking me back 45 years.
Q I wasn't trying to insult you.
A I'm aging myself.
Q I probably can't remember what I did either. In general, then --
A It was the effect of angle of attack on the heat transfer coefficient of tubes.
Q I guess what I was looking for was, it wasn't about reservoir modeling?
A No.
Q For lack of a better term, the first step in your analysis in this case was to true up your VIP model with the BOAST model results. Is that true?
A Right.

1208

Q And by "true up," I mean you ran the same scenario in VIP, and then examined the results Mr. Casey achieved in BOAST, and to your mind it was similar enough you could use VIP and compare apples to apples. Is that a fair representation?
A That's a fair representation, yes.
Q And specifically, which modeling analysis did you use as your base case?
I'm going to call that "base case." It's Mr. Casey's BOAST model results. Is that fair?
A Okay.
Q Do you know what modeling scenario you relied upon?
A I used the one that was described in his second engineering report, which would be the one with an 80.9 millidarcy permeability and a nontransmissive fault.
Q The original modeling scenario that is actually part of the application in this case?
A Since then, yes.
Q Since when, sir?
A Since I presented the other modeling. My charge at the time was to look at the -- I guess I don't have the right word here -- the Commissioner's, the judges, the whomever -- that said, Let's go back and run an 80.9 millidarcy nontransmissive case.

1209

Now, it is my understanding that those are the only two changes that should have been made in going from their previous reported model to -- or their Engineering Study 1, which I am guessing was submitted as part of the application.
MR. RILEY: Objection. I really don't have a question that I can recall this is responsive to.
JUDGE WALSTON: I don't recall the question.
MR. RILEY: I think I asked did you do any analysis of an earlier modeling that's part of the application?
JUDGE WALSTON: Go ahead and ask the next question.
Q (BY MR. RILEY) Mr. Fairchild --
MR. RILEY: And I ask that the last part of that answer be stricken in the event that anybody claims it opens the door to something else that I'm certainly not asking about.
JUDGE WALSTON: The more I think about it, I think your question was: Did you do any additional modeling?
MR. RILEY: I think I asked a different question, but let me --
WITNESS FAIRCHILD: Should we read it

1210

back?
(laughter)
JUDGE WALSTON: Ask your next question.
MR. RILEY: I guess if you sit in a room long enough, you start to take over.
Q (BY MR. RILEY) Mr. Fairchild, you performed some analysis that you testified in a prefiled case. Right?
A Right.
Q Are you telling us that you did some additional work that is not reflected in your prefiled testimony?
A I made some additional runs, yes.
Q Have you provided those additional runs to counsel?
A Yes.
Q Have they been provided to us as far as you know?
A As far as I know.
Q Now, I want to be very clear on this point. I am not asking you any questions about the additional work that you did outside of your prefiled testimony.
Do you understand that?
A Okay.
Q If I inadvertently suggest that I am, I am not. Is that understandable?

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A I think I understand.
Q In preparation of your prefiled testimony, did you do any analysis of the original modeling that was submitted to the TCEQ by Mr. Casey and his firm that supports this application?
A Can you define "analysis"?
Q Did you look at it as part of preparation of your prefiled testimony?
A Yes.
Q Did you evaluate the validity of that model?
A I have an opinion, yes.
Q The task, as I understand it from your deposition on May 21, 2010, you told me that you were retained by Denbury in this matter with a limited charge. Is that correct?
A Do you have a page and line number, please.
Q Let me see if I can find it. Well, I tell you what, let's just go at it directly.
Forget your deposition, what was the scope of your engagement with Denbury as it pertains to this case?
A It was to review the TexCom model; and beyond that, it was probably somewhat open ended.
Q If you testified differently in your deposition, then that would have been incorrect? Is

1212

that right?
A I'd like to read the deposition.
Q Have you read the deposition since it was taken?
A I would prefer to read -- before I comment on that question, to read --
Q It's a hypothetical, sir. But did you read the deposition after it was taken?
A Yes.
Q And did you correct errors in the deposition on what's referred to as an errata sheet?
A I did.
Q So is it safe to assume that any errors you picked up when you read the deposition are reflected in the errata sheet?
A That's correct.
Q So my hypothetical question is: If your scope of engagement in this matter is described differently than what you just described live in your deposition, then your deposition is in error. Is that correct?
A I don't know whether they are different or not.
Q I am asking you to assume they are different. Would it be incorrect, then, in your deposition?
A If you are saying they are different, then they are different.

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Q I am not suggesting one way or the other. What I'm asking --
A You just said assume.
Q That's a hypothetical.
Hypothetically, if you described the scope of your engagement in this matter differently in your deposition, one is right and one is wrong. Correct?
A I'd prefer to read the scope, as I put in my deposition, if we want to do that. I don't know that I hypothetical means anything.
JUDGE WALSTON: In fairness to the witness, just saying "different" doesn't necessarily mean right or wrong. He should be entitled to see what he has stated.
MR. RILEY: Just give me a second. I was hoping not to take this time, but it will take me a minute to review.
Q (BY MR. RILEY) Let's turn to your deposition, Page 154, and the answer beginning on Line 5.
Would you read that to yourself, please.
A I don't have a copy.
MR. RILEY: May I have Mr. Lee approach the witness?
JUDGE WALSTON: Can you direct him again.
MR. RILEY: Certainly. The answer

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beginning on Line 5, and I am just asking him to read it to himself.

A On Page 154?

Q Yes, sir. In that answer -- well, tell me when you are ready, sir.

A I have read Line 5 through 12.

Q In that answer you refer to an objective. And I understood the answer to relate to your objective in this case. Is that correct? And read more, up or down, in whichever way you need to to put it in context.

A I think it starts out, it says it's very clearly --

Q Sir, I'm asking you to read it to yourself. Read as much as you need to to answer my question, if you don't mind.

A Please restate your question.

Q My question is: Does the answer refer to your objective in this case, and is your objective in this case described in that answer?

A I have to answer that by saying, taken in context with my prefiled testimony, since that answer refers to the prefiled testimony, I think they go hand in hand.

Q Let me read, then, the answer, then -- at least you are oriented now, at least, to my question.

1215

There is a long examination here, and it's kind of out of context, but let's see if we can get through it. The answer on Page 154, Line 5.

The answer is: "No, I did not do what I was told. We had a study objective, and my objective is very clearly stated, I think, in my prefiled testimony. My objective was not to make a demonstration case that would be submitted to the TCEQ. My objective, as you have put it, is to be on the other side of the fence to offer the TCEQ information that would make them think about maybe there are some other things they need to consider before they would give this permit."

Is that correct?

A That's correct.

MR. RILEY: If we can get the document back, Mr. Lee?

JUDGE WALSTON: Okay.

Q (BY MR. RILEY) So your objective, then, is to give the TCEQ some things to think about. Is that correct?

MS. MENDOZA: Your Honor, the witness has asked and answered this. Counsel has actually read testimony about this.

JUDGE WALSTON: It's cross-examination. I'll overrule it.

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Q (BY MR. RILEY) Did you hear my question, sir?

A Please restate it.

MR. RILEY: I'm going to have the reporter read it back.

(The record was read as requested.)

A That's what that answer in the deposition said, yes.

Q (BY MR. RILEY) That's not my question, though.

My question is: Is that your objective?

A That was an objective stated in the deposition.

Q Sir, as you sit here today, is that your objective?

A That's part of it.

Q If I understood your answer a moment ago, that the things to think about, as you characterized it for the TCEQ, are reflected in your prefiled testimony. Is that right?

A I recall we --

Q Sir, did I say it right?

A Yes.

Q Thank you.

Did you do any analytical solution modeling in this case?

A No.

Q Do you know what model TCEQ relies upon when it

1217

reviews Class I UIC nonhazardous waste applications?

A PRESS2.

Q Have you ever utilized PRESS2 in your work?

A No.

Q Do you have any reason to believe PRESS2 is unreliable?

A No.

Q In your experience in applying on behalf of clients for Class I permits, have you found the TCEQ to be conscientious in its work?

A Yes.

Q Have you ever received a notice of deficiency in any of your applications?

A All I can say is probably.

Q Is there a limitation in the permit referred to as injection pressure?

A In the permit application, yes.

Q In the proposed permit -- the proposed permit for WDW410, is there an injection pressure limitation?

A I understand, yes.

Q Do you know what it is?

A 1250 pounds -- I think it's psi -- at surface conditions.

Q Can one calculate a bottom hole pressure based on that injection pressure limitation?

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A Under what conditions?
Q Injection of Class I -- excuse me -- of nonhazardous acquiescence waste.
A Given more information than you have just stated, yes.
Q What would you need?
A You would want rate, you would want completion type, you would want the --
Q Sorry. Could you go a little slower. Weight?
A Rate.
Q Rate.
A Completion type.
Q Completion type. By "completion type," could you explain what you are referring to?
A The pipe you are injecting down, the depth -- diameter, type of pipe, temperatures, density of the fluid.
Q Temperature, density of fluid?
A I think you said for a liquid.
Q Yes, sir. Anything else?
A That's all I can think of, but there may be other data that you need.
Q You have been in this line for some time. Correct?
A Yes.

1219

Q So I am asking you -- if I asked you to calculate a bottom hole pressure I need to provide you certain information. Correct?
A Correct.
Q So we have 1250 psi, and you said you need a rate of injection. Is that correct?
A Yes.
Q Do you know the rate of injection proposed for the TexCom operation?
A Maximum 350 gallons per minute.
Q Would that substitute for rate that you need in the list of items you require?
A Yes.
Q You said you needed a completion type. You have depth, diameter, and type of pipe is what I jotted down. Were those the things that you needed?
A Correct.
Q Are those contained in the TexCom application?
A I believe so.
Q Temperature. You mentioned that you needed temperature. What temperature information do you need?
A The temperature of the fluid as it goes down the pipe.
Q Is there a temperature of the fluid as it goes down the pipe that you can refer to in the TexCom application?

1220

A There is a reservoir temperature referred to. I don't think in the permit that there is a defined temperature for the surface.
Q So is that something you are missing, then? You don't have enough information, then? Based upon your understanding of the TexCom application, you don't have the value you need to calculate a bottom hole pressure?
A If it's there, we would have it. I don't recall seeing that particular number referenced.
Q Have you reviewed the full application?
A No.
Q In your experience with Class I permit applications, is that the type of information that's required by TCEQ?
MS. MENDOZA: Sorry. What is the reference -- is that the type of information? What type of information?
MR. RILEY: I thought it was clear.
Q (BY MR. RILEY) Do you understand my question, sir?
A No.
Q You mentioned temperature of the injectate -- I'll call it. Is that a fair word to use?

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A Okay.
Q You have done Class I applications before. Is that correct?
A Right.
Q Have you provided temperature information for the injectate in the work you have done for other clients?
A I don't recall doing that, no.
Q So to the best of your knowledge, right now you are missing at least one piece of information that would be necessary for you to calculate a bottom hole pressure that correlates to a surface injection pressure of 1250 psi so far. Is that right?
A I think we have identified one, yes.
Q And density of fluid, do you have that information in this case?
A You mean in the permit?
Q Yes, sir.
A I think they provide a range.
Q Would that allow you to calculate a range, then, of bottom hole pressure, assuming you had the temperature information that we just discussed?
A That would.
Q So it seems as though -- have I been complete, then, that all the information you described needed to

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calculate a bottom hole pressure that correlates to 1250 psi injection pressure with the exception the temperature of the injectate is provided in the TexCom application as best you understand it?

A Not really.

Q So there is something missing still? I am asking you for your list, and I want to run through the items. So tell me what I have left off the list.

A Well, when I said the completion and the type of pipe, if we are going to consider friction in that calculation, we don't have a friction factor.

Q That's the type of pipe -- I mean, this well is constructed. Is that correct?

A Yeah, but that's specific to a particular well, and you could make some assumptions as to what you think, based on your experience, what the friction factor might be. But if we are going to do a precise calculation, it might say that we ought to determine that friction factor. We ought to history match that calculation.

Q History match the calculation?

A Uh-huh, to real data.

Q So you want a history of well or injection pressures, what, pressures to history match?

A To do the calculation for the TCEQ, no.

1223

Q Well, that's kind of the context of our discussion here. Would you agree?

A Okay.

Q For TCEQ purposes, then, can we leave out the friction factor?

A Yes, because I don't think they will accept that calculation from surface to bottom hole without consideration for friction.

Q Do we know the type of pipe in this case in WDW410? Do you know it?

A I think it's in the application, yes. I think I've looked at that.

Q In your experience when confronted with a situation where there isn't history, can you calculate or estimate a friction factor?

A Yes.

Q What would you estimate the friction factor to be for the type of pipe in WDW410?

A Off the top of my head, I don't know.

Q Could you have done that work prior to your testimony today?

A Did I do that work?

Q No, could you have?

A Yes.

Q Do you recall me asking questions along these

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lines in your deposition in May -- along these lines, I mean, about bottom home pressure that correlates to injection pressure at 1250 psi?

A Yes.

Q Let's talk about the modeling that you did in this case.

MR. RILEY: It's 10 minutes to 12:00. Do we want to break for lunch? I'm shifting gears, and I'm going to change topics, so this would be a convenient point for me.

JUDGE WALSTON: How much more do you have?

MR. RILEY: Probably another hour.

JUDGE WALSTON: Why don't we return at 10 to 1:00. We'll break for one hour.

(Recess: 11:50 to 12:56)

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AFTERNOON SESSION

TUESDAY, JUNE 22, 2010

(12:56 p.m.)

JUDGE EGAN: We'll go ahead and go back on the record in SOAH Docket 582-07-2673, 582-07-2674. It is about five to 1:00.

Mr. Riley, you're still cross-examining Mr. Fairchild.

Mr. Fairchild, I'll remind you that you're still under oath.

MR. RILEY: Yes, ma'am. And I have an application that I mentioned -- I expected having before I proceed with cross-examination of Mr. Fairchild. I think we alluded to the discovery request made of Denbury -- let me see if I can give you a date. I'll give you the date after a second. It was several days after the prehearing conference where Denbury was admitted as a party. We were quick to respond to that admission as a party and we filed -- or we submitted discovery requests to them sometime that week, as best of my recollection.

As part of those requests, we asked specifically for any records or information regarding Denbury's plan to inject carbon dioxide into the Conroe formation. The request was broad. It was Request No. 6

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in our discovery request, and I'll read it to you just quickly, "Produce all documents related to Denbury's plans for CO2 enhanced oil recovery in the Conroe Field as described in its filing, including but not limited to any applications for or issued authorizations."

MS. MENDOZA: Excuse me, can I ask, what was sort of the -- was that y'all's first discovery request? I can't remember if there were multiples from y'all. I'm just looking for it on my system.

MR. RILEY: It was the first set of discovery requests, and Mr. Lee will try to find a date for me in a second.

Not to belabor the point, but we asked for the information that this witness has described that he had generated and has not produced. I mean, the information he's described in terms of analyzing the Conroe formation or modeling the Conroe formation, particularly for CO2 injection, is covered by the production request. The information was not produced. And we are confident that no documents provided by Denbury reflect or reassemble the documents Mr. Fairchild described earlier, the spreadsheet documents.

My application is to strike Mr. Fairfield's testimony -- Fairchild's testimony. The

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reason is all of his testimony pertains to modeling in the Conroe field. And I will tell you that I asked numerous times of other witnesses, not necessarily Mr. Fairchild, about the specifics of Denbury's plans. And I was told repeatedly we haven't gotten that far along, and I can find those references in their depositions. But when I asked pressure information or reservoir information, I was told "we're not that far along. We just acquired the field," implying or if not just misrepresenting their investigation prior to acquisition on this particular topic.

So the application is before you and I'd stay silent now.

MS. MENDOZA: Your Honors, I first want to ask that counsel actually find those references if he is going to say that we misrepresented anything to him, or any witness in any way misrepresented anything to him in the depositions. I want to make sure we're in context.

The second thing is -- is that I think what Mr. Fairchild is referring to is some data that found its way into a management presentation that Denbury made in the course of its acquisition. This management presentation was the subject of a protective order. It's called "A presentation entitled 'CFR - Montgomery Field Unit - Wapiti and XTO Energy Interest

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December 2009'."

Counsel has been aware that this document has existed much like the seismic. We had it subject to a protective order. The protective order did not order us to produce. The protective order said that to the extent that these documents were designated for copying they would be marked confidential.

Shortly after this protective order was entered, the protective order covered three things: Denbury's land files, Denbury's well files and this presentation. Shortly after this was entered, Ms. Nikki Adami Winningham, who is one of the counsel for TexCom, on May 11th sent me an email that said, "Mary, now that the protective order is in place (Order No. 25), we would like to request copies of the documents related to the wells listed below. Please let me know if you need more identifying information: Oil producing well numbers," and she listed three wells, "Injection well numbers," she listed three wells, "Thanks, Nikki."

She told us what she wanted that was subject to the protective order. She did not say that she wanted this last presentation. We could not anticipate this. I am also going to -- representing Mr. Fairchild will let the parties know this -- that the actual input and output files that generated this

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information were lost long ago before this hearing began, so we had no way of obtaining them.

MR. RILEY: May I respond just briefly?

JUDGE EGAN: Actually, what I'm going to ask parties to do is -- from what I understand from what Mr. Fairchild testified to earlier -- it was not -- you did not look at this information that was generated back in 2009. Is that correct?

WITNESS FAIRCHILD: Probably 2008.

JUDGE EGAN: 2008. And, Mr. Riley, I understand that you made a discovery request. I don't know exactly what transpired, so what I'm going to ask is if there is documentation that is responsive to the discovery request to get it to him. In the meantime, file a written motion and identify in the transcript anything that you believe needs to be struck. I'm not going to strike the entire -- I don't think we're going -- we're not inclined, at least at this point, to strike the entire witness's testimony.

MR. RILEY: I understand.

JUDGE EGAN: But if there's anything that's relevant or that -- if it prejudices you in any way, we will entertain whatever motions are appropriate. But right now, it's "he said" "she said" and I don't have anything in front of me.

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MR. RILEY: I understand. And let just respond to one point Ms. Mendoza made so I can at least set the context. As you know, from the outset there have been allegations -- or at least direct testimony on Denbury has some plans for the Conroe Field. There was even some early testimony or discussion of what Denbury knew and when it knew it. So these files that we're talking about, as Mr. Fairchild described them, are spreadsheet data-type information. I don't think it's reasonable for Ms. Mendoza to expect us to think that these were modeling -- that there's modeling information in the words "A presentation entitled CFR - Montgomery Field Unit - Wapiti and XTO Energy Interests December 2009." That's the -- in the protective order that's the descriptor that Ms. Mendoza offered of the information that we declined. We didn't need a presentation. We wanted data. That's what we asked for.

And the point being that it also refers to December 2009. The information, as the witness just told you, was generated in 2008. So we really don't have a fair characterization of that information, but I will put that in paper and let you-all decide from there.

MS. MENDOZA: And I will also respond with the excerpts in which this was disclosed in the

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deposition as well. Mr. Riley asked for certain things that were disclosed in the deposition. We produced them. He did not ask for this, and it was similar to the seismic he knew.

JUDGE EGAN: We'll address it when y'all file the written motions. But right now we're going to proceed with this witness.

MR. RILEY: Thank you.

PRESENTATION ON BEHALF OF DENBURY ONSHORE, LLC

(CONTINUED)

JAMES. W. FAIRCHILD,

having been previously duly sworn, continued to testify as follows:

CROSS-EXAMINATION (Continued)

BY MR. RILEY:

Q Mr. Fairchild, you were provided an analysis of the geology in the Conroe Field by Mr. Herber. Is that correct?

A No.

Q Did you discuss the geology in the Conroe Field with Mr. Herber or any geologist working for Denbury prior to your testimony today?

A When I was building my model, I discussed a structure map for the Conroe Field, and we have discussed that as the Geomap.

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JUDGE EGAN: Could you move the microphone closer because I couldn't hear what you just said. Would you repeat it?

A We discussed a structure map.

Q (BY MR. RILEY) You had conversation with a geologist in this case who's testified the last couple of days named Mr. Herber. Correct?

A Correct.

Q And you spoke with him about the geology of the Conroe formation or the Conroe well field. Is that correct?

A Geology is a collective big term, so you'll have to be more specific.

Q Okay. Do you practice in the field of geology?

A No.

Q Do you in this case base any of your opinions on any geologic interpretations?

A I used some geologic interpretations that were part of the Casey reservoir model. I accepted them, put them into my model. In addition, as we have discussed before, I used a structure map which was -- I used both his structure map and I used a different structure map.

Q Okay. Does structure map fall within the area or under the heading of geology in your mind?

A It would come under geology.

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Q Okay. And you discussed a structure map with Mr. Herber. Is that correct?

A That's correct.

Q Mr. Herber is a geologist. Is that correct?

A Yes, sir.

Q Do you consider yourself a geologist?

A No.

Q In your work as a reservoir engineer, do you rely on geologic interpretations of other persons?

A I do.

Q Did you rely on such interpretations of the geology of the Conroe Field in this case?

A From whom?

Q From anyone, sir.

A Well, of course.

Q Okay. So now would you please tell me what geologists you rely upon in rendering your opinions in this case?

A I relied upon a Geomap structure map that Mr. Herber and I discussed. And we said that if we project that down -- and I think it was on top of the Cockfield, Upper Cockfield to the Lower Cockfield, is that going to be a reasonable representation of structure? We did that.

With regard to other geologic parameters,

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porosity, permeability, thickness, those would have come from the Casey second engineering report. Now, I may have missed a geologic parameter, so if there's one you're interested in, ask me and I'll tell you where I got it.

Q Sure. Let's talk about the structure map. In discussions with Mr. Herber, did you discuss the 4400-foot fault?

A No.

Q Was it represented on the structure map Mr. Herber provided you?

A No.

Q Do you have the structure map that you relied upon that was, I guess -- I'm assuming, and maybe I shouldn't -- that was developed by Mr. Herber?

A Mr. Herber did not develop a structure map that I used.

Q On Page 5 of your prefiled testimony, you discuss or you list the resources you relied upon in performing your analysis. Correct? Page 5, I believe, beginning on Line 16.

JUDGE EGAN: I'm sorry?

MR. RILEY: I'm sorry, Page 5, Line 16. And it's Denbury Exhibit 4.

JUDGE EGAN: Okay. Thank you. Go ahead.

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Q (BY MR. RILEY) Have you found that testimony?

A Page 5, which line?

Q Line 16.

A Okay.

Q Are you there, sir?

A I'm there.

Q I see that the question is to you: "What resources did you primarily rely upon in performing your analysis," and there's a list below that in your answer. Correct?

A Correct.

Q The third item down from -- counting correctly -- is "A Geomap supplied to me by Denbury."

A Correct.

Q Is that a structure map?

A Yes.

Q Is that the structure map you're referring to just a moment ago in our discussion?

A Correct.

Q Do you know if that Geomap was developed by Mr. Herber?

A It was not.

Q Do you know who adopted it?

A It was purchased from Geomap.

JUDGE EGAN: It was purchased from who?

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A Geomap. Do not know who developed it.

Q (BY MR. RILEY) Well, are you suggesting or saying that the Geomap supplied to you by Denbury is actually a commercial product that was obtained from some third party?

A Correct.

Q Do you have Denbury Exhibit 17 in front of you?

MS. MENDOZA: Your Honor, this is the exhibit that's subject to the protective order that we entered into in from yesterday forward. So if we're going to display it to everyone, I'd like to make sure we deal with that.

JUDGE EGAN: How would you -- other than indicating it's confidential and --

MS. MENDOZA: Do we have other people here in the room that are not bound by the protective order?

MR. FORSBERG: Individuals from Montgomery County are not parties to the case.

JUDGE EGAN: In that case we'll have to excuse those individuals while we're talking about the confidential. I don't know who they are. Is there anybody else here that's not subject to the protective order, Mr. Forsberg?

MS. MENDOZA: And if we can ask if this portion of the transcript be marked as confidential.

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JUDGE EGAN: Yes, you can. It will be marked as confidential.

(The following ^^pages, through , are confidential and under separate cover.)

1244

Q (BY MR. RILEY) All set, Mr. Fairchild?
A Okay.
Q We talked about this this morning -- you began by truing up the VIP model to the BOAST model. Correct?
A I built what I call a clone of the BOAST model.
Q A clone. What did you specifically do in the VIP program to build this clone?
A I entered the best I could the same data that was entered in the BOAST model.
Q Do the programs work in a similar fashion? Do they have the same inputs?
A In some respects.
Q Okay. It's going to be helpful to me if you would explain what precisely you did in developing your clone in VIP.
A I reviewed Mr. Casey's Engineering Report 2. Extracted from his -- the files that we had, I extracted his structure, his thickness was constant to 145 feet, so that was easy. His porosity was constant at 24 percent, so that was easy. The permeability was instructed to be 80.9 millidarcies. I would have pulled viscosity of the fluid. I would have pulled the density of the fluid. I would have pulled his well location and is specified the same parameters in the VIP model.
Nothing else comes to mind, but there

1245

probably was other data that I needed.
Q Okay. Did you find all the data you needed to run VIP in Mr. Casey's modeling?
A I think that's correct.
Q Okay. What I'm looking for -- mean to go indirectly toward it -- is, is there some data you had to generate that you didn't find in Mr. Casey's model that you put into VIP?
A Without looking at a actual data file, I think the answer is I didn't have to do anything different, but I may have.
Q You just don't recall whether you had to create a data input of your own?
A I may have had created some myself.
Q It's my understanding from our time together in your deposition that you had specific instructions from Denbury as to what they wanted from you in this case. Is that true?
A We had a meeting on April 24th where we defined some of the things that we wanted to do. And then as we moved forward, finding -- learning what we learned, that objective would have kind of grown.
Q The results of your clone model then are reported here as compared to BOAST. Is that right? And "reported here" I mean in your prefiled testimony.

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Could you show us the portion of your prefiled testimony or the graph you generated comparing the BOAST and VIP models?
A Denbury Exhibit 7 in my prefiled testimony, the -- I'm not sure what you call that symbol, the red symbol -- I pulled that from Mr. Casey's file. The blue solid line was my VIP calculated, and that is the bottom hole pressure -- bottom hole injection pressure versus time.
Q Let's go back to Exhibit 6 if you don't mind in your prefiled. What is Exhibit 6?
A Exhibit 6 is my take on the -- what I call BOAST/Casey file as far as his predicted bottom hole injection pressure and psia on a vertical axis and time on a horizontal axis, illustrated in years.
Q Now, you have -- as you describe, you have -- In Exhibit 6 you have it looks like little people to me, but it's not quite an x and it's not quite an asterisk. But the symbols there depict data points taken from Mr. Casey's model. Is that your testimony?
A Right. I read those pressures from out of his output file, and Mr. Gates gave me the symbol.
Q Mr. Gates gave you the symbol?
A The symbol, yes.
Q Then -- I'm really not quibbling over the

1247

symbol. It's just hard to call it anything.
A Okay.
Q What caused you to pull those readings, those pressures as opposed -- it's a data set, right? So what I think I'm understanding is there's more data in Mr. Casey's files, but you selected certain points and you pulled those pressure --
A No, I think -- I would have -- I read his output file, and any time he took a printout of -- or a well summary, I pulled the pressure. So this would be where he had pressures reported in his output.
Q So anywhere he had a pressure reported in his output, you put it into this table or this graph? Is that correct?
A For that pressure that we're talking about, the bottom hole injection pressure.
Q Okay. So I'm imagining a data file that you obtained somehow that reports -- or purports to be Mr. Casey's data output. Is that right?
A Correct. After a simulation.
Q After a simulation. So the output then is -- you picked a particular output or is it the only output from his simulation that you selected?
A I believe this was the only output for that particular parameter.

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Q And for that particular parameter you're referring to a bottom hole pressure. Correct?
A Bottom hole injection pressure.
Q Bottom hole injection pressure?
A Right.
Q Okay. And so what bottom hole injection pressure -- I'm sorry. Am I misunderstanding then, you looked at a data set and it seems like you needed a starting point. So did you select a bottom hole pressure output starting point?
A An initial reservoir pressure would have been taken from his file. That's something we missed a minute ago when I said I pulled other information. In doing your simulation, you have to have a starting point. And so I would have used his starting point or I actually would have put in a -- because they go in different in the model, I would have adjusted what I needed so the VIP would give me a starting point very similar to his.

Now, with no production, the flowing bottom hole injection pressure will be the same as the grid block pressure that that well is effectively completed in.

Q Okay. Is it -- am I correct then, based on ... what I'm gathering from your testimony -- is that there

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were other data points in Mr. Casey's modeling that you did not utilize. Is that correct?
A Not for flowing bottom hole pressure.
Q Not for flowing bottom hole pressure?
A I believe I used the bottom.
Q You plotted that, those flowing bottom hole pressure numbers, from the output file on this graph, which is now Denbury Exhibit 6. Correct?
A Correct.
Q And then you ran a simulation with the VIP/BOAST equivalent. Is that correct?
A With the BOAST equivalent model, yes.
Q Okay. And what I'm striving toward is did you have to modify the VIP software in some way to call it VIP/BOAST equivalent? Did you have to do something to the program?
A No, that's a data input. It's a comment card.
Q So you didn't -- I mean, I'm imagining a code or a commercial product, say, for maybe folks who don't do your type of work, a software program, is that what VIP is?
A Effectively, yes.
Q And within VIP are there operator parameters -- I'm not really talking about the input parameters for this modeling exercise -- but are there adjustments an

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operator or user might make to the model that tweak the model, so to speak, for a particular engineer's opinion?
A I'm not sure I understand your question, but I think the answer is no.
Q So I guess what I'm getting at is did you reprogram VIP in some way?
A No, we do not have access for the Fortran code for VIP.
Q Okay. So then you put the inputs in that you've described. You ran the model. You developed a curve, which I think is reflected on Exhibit 7. And to your mind it was sufficiently similar to the data you took from Mr. Casey's output file to conclude that the VIP model was equivalent to BOAST?
A Yes.
Q And I want to be clear on terminology here. At least in my mind the VIP/BOAST equivalent really is you just ran VIP to see if it ran the same numbers as BOAST. Is that right?
A With the same data input.
Q That's right. That's what I understood. Thank you.

Now, you use a metaphor or analogy that was helpful to me in terms of setting up a model in the context that we're discussing, and that was sugar cubes?

1251

A I did.
Q And we talked about this in your deposition, but to bring everybody else up to speed who wasn't there, I'm imagining -- I don't see sugar cubes a lot anymore -- but a box of sugar cubes, and that is one dimension, so to speak, of your modeling exercise. You size those cubes as you saw fit. Correct?
A In this first run, I used the same size cubes that Mr. Casey would have used.
Q And you have some issue --
A It is not a box with -- sugar cubes in a box are generally of equal size.
Q Right.
A These cubes are not of equal size.
Q Okay. And that's helpful. I think the sugar cubes are most helpful to me when we get to talking about boundaries in the model.
A Okay.
Q But for purposes of just sort of painting the picture for the ALJs, different size sugar cubes were modeled in the BOAST model. Correct?
A Correct.
Q You have some -- offer some criticism of the size of those cubes from your perspective that Mr. Casey and his modeler Dr. Layne that they used in their

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original modeling. Is that true?
A Yes, I do.
Q And you used different-sized sugar cubes then?
A I used a more refined grid system -- or more refined -- more sugar cubes.
Q And smaller sugar cubes in certain places?
A In general they were smaller.
Q Now, I think we discussed this -- and please tell me if I've misunderstood your testimony -- the benefit or a benefit to having smaller sugar cubes is -- the primary benefit is that you can refine a model by changing the parameters of those sugar cubes within the sugar cube itself when you have sufficient information to vary those parameters for a particular cube. Is that right?
A You could have each cube having a different geologic characterization. I guess you could put it that way.
Q Okay. Did your sugar cubes -- and I'm sorry to keep going there, but it just helps me think -- did your sugar cubes have all the same geologic parameters?
A They did, except for size.
Q Except for size. So the only difference then in the sugar cubes in the modeling you are testifying about in this case is the size of the cube?

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A Yes.
Q Now, since you offer criticism of Mr. Casey's technique or his modeler's technique in this area, help me understand why it makes a difference in your modeling as to the size of the cube, given that you didn't vary any parameters within the cubes?
A Now, are we talking about -- I have to ask a question --
Q Sure.
A -- on Exhibit 7 --
Q Well, no, because you said you kept the cubes the same size as Mr. Casey's on Exhibit 7. Correct.
A Everything was the same -- Exhibit 7 I believe was a clone of Mr. Casey's.
Q All right. And here's a question that sort of -- you call to mind by pointing that out. It looks like you've got a curve out of your model, that you didn't have individual data points, you actually generated a curve from your model. Is that right?
A Actually, I have individual data points, but I plotted them in Excel as a curve just to illustrate the difference.
Q Okay.
A And I would have more data points than what he would have. I would have at least one a year probably.

1254

Q Well, and --
A That's user control.
Q I'm sorry. And all I'm trying to get at really is are Mr. Casey's data points then representative of cube size? In other words, if you look at the data points on Exhibit 7 and the output --
A There's no relationship to where his data points are. They're a relationship in time.
Q Okay. So I guess I made an assumption that was incorrect. But you plotted a curve for your data points, but your data points are actually -- were they more numerous than Mr. Casey's on that curve?
A I would have had more points than he had, yes.
Q And is that relationship to the box -- or, excuse me, the sugar cube concept?
A No.
Q All right. In your later analysis -- I believe Exhibit 8 is the beginning of that analysis -- you have several lines plotted on this graph. Again I think it's bottom hole injection pressure on a y axis and then time on the x axis. Correct?
A Correct.
Q So that's the same relationship that you're trying to depict in Exhibit 8 as you were in Exhibits 6 and 7. Correct?

1255

A Correct.
Q And you have a curve, which I assume is consistent from the prior exhibit, that's a solid blue line that's your VIP/BOAST equivalent. Correct?
A Correct.
Q And then you varied something in this run to create the dotted blue line and you show a difference of 700-psia. Correct?
A After 30 years.
Q After three years because --
A -- thirty years.
Q I'm sorry. After 30 years. I'm sorry.
A You referred to 700.
Q Right. Thank you. So you show that for some period of time the curves are -- I've assumed they overlay each other. Is that correct?
A Pretty much.
Q And they start to deviate at about -- looks to me about year three.
A Thereabouts.
Q All right. And about the -- would one be able to discover the difference -- right now we're -- we don't have history as we talked about earlier this morning. There's not history for waste injection into this well. Correct?

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Similarly, we don't have information about pressure created in the reservoir after some years of operation as well because it's not in operation. Correct?

A That's correct.

Q But the pressure differential -- I'm sorry, what was the change? What caused the change in Exhibit 8 that you've identified?

A When I built the clone model, I realized that that particular model -- and we need to -- I want to be sure to point out that that was the model with the steel plate for the fault.

Q Steel plate at the fault.

A Steel fault -- steel plate, non-transmissive.

Q Okay.

A And --

Q Because I -- we're speaking figuratively, of course, because we don't want anyone to believe there's a steel plate at this fault, right?

A In the model I effectively inserted a steel plate.

Q Okay.

A Okay. So all that's important in that model is from the 4400 fault north.

Q Okay.

1257

A South of the fault it's like it's not there. Okay? But I realized that on the boundary of their grid system north of the fault this would be a row -- in my terminology -- a row going across an x and then going down in y on both sides of the model they had used in that 1100 foot -- 11,000 foot gridlock, they had used 340 percent porosity.

Q Okay. This is the superporosity issue we touched on this morning. Correct?

A This is the superporosity issue.

Q So am I following you that you changed that porosity in some way to generate the dotted line on Exhibit 8?

A Right.

Q What did you do?

A What I did is I put that porosity to 24 percent rather than 340 percent. And then, in addition to north of the fault on the east, west and north side of that boundary, I attached what we call an analytical aquifer. I attached a Carter-Tracy aquifer.

JUDGE EGAN: I'm sorry?

A I attached what we call a Carter-Tracy aquifer to the simulation people. There are other techniques that you could use. That's the one that I'm accustomed to using, and so I attached that.

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In effect, what you're saying is in the superporosity case there -- at the boundary of the model --

Q And I assume we don't mind the witness describing -- I probably would have asked him these questions, but we are --

A Okay. You ask me questions.

Q -- of asking questions and getting precise answers.

JUDGE EGAN: Just answer his question, please.

A Well, I think I was because he asked me what changes I had made.

JUDGE EGAN: Yes.

Q (BY MR. RILEY) Yes, sir.

JUDGE EGAN: Just so I make sure, you changed the porosity from 340 percent to 24 percent?

WITNESS FAIRCHILD: The 24 percent in those grid blocks where they had 340.

Q (BY MR. RILEY) Okay. And you also explained -- and I was actually going to go there anyway -- but with the rule in place, we want to try to be tight on this.

You applied an analytical solution to that boundary -- to those boundaries of your sugar cubes.

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A Correct.

Q And that's the Carter-Tracy analytical aquifer. Is that the way to refer to it?

A That's correct.

JUDGE EGAN: Carter-Tracy?

WITNESS FAIRCHILD: Carter, C-a-r-t-e-r T-r-a-c-y.

JUDGE EGAN: Thank you.

Q (BY MR. RILEY) Are there any other changes you made in generating the dotted line we've been discussing on Denbury Exhibit 8?

A I don't think so.

Q Okay. And this, I think, if I'm not off base here, this is the error you said is common among reservoir engineers?

A Simulation engineers, yes.

Q Simulation engineers. And the common mistake is to put superporosity in an outer boundary? Is that the common mistake?

A It's a quick, convenient way to attempt to simulate an aquifer.

Q Okay. So then you make those changes and you show really over the 30-year period of injection that the pressure predicted by Mr. Casey's model is low by some 700-psia as compared to your changes -- the model

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you just described. Is that right?
A Correct.
Q That pressure change -- I mean, the lines track differently based on Denbury Exhibit 8. Correct?
A They do.
Q And about 2016 would you say you could measure that pressure differential if that were actually happening in the reservoir?
A Would I physically measure it in the reservoir?
Q Yes, sir. Let's suppose you do an annual fall off test, which I assume would give you a bottom hole pressure at the time you conduct the test. Is that true?
A If that pressure gives you a static reservoir pressure, yes.
Q Okay. Well, I'm asking in your science, in your area of expertise, could one measure reservoir pressure after four years of injection and discover the difference in the two lines, if it existed?
A No.
Q Okay. So the assumptions in this modeling -- these modeling exercise are 30 years of constant injection. Correct?
A Correct.
Q Maximum rates, with the only limitation being

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the pressure -- injection pressure at 1200-psi. Is that correct?
A That's what's being asked for in the permit.
Q Okay. And if I'm understanding you correctly -- let's just make it more exaggerated. If we looked out further as we get -- approach year 30, would there be a point in time where one could say whether, based on actual data taken from the well itself, after a period of injection where we can figure out whose line was correct on Exhibit 8?
A No, because you have implied that the reservoir going forward is going to be operated, say, per the dashed line, and then it's going to be operated -- in other words, in the reservoir we don't know which line we're on.
Q That's what I'm asking.
A We would get a point, but where to put it we wouldn't know.
Q Well, maybe I'm misunderstanding.
A Okay.
Q But we have a bottom hole injection pressure. Okay?
A Correct.
Q And I thought what the model was doing was trying to simulate that bottom hole injection pressure?

1262

Is that incorrect?
A Okay. The answer to your question is yes.
Q Okay.
A If we say after five years, ten years shut the reservoir in and maybe by a fall-off test or whatever just to get a -- no, a little more complicated. This is a dynamic pressure. This is not a shut-in pressure.
Q Okay. So what would a shut-in pressure tell us? Or can you take a dynamic pressure and read it?
A If you want to hang a gauge in the hole while you're injecting.
Q Okay. So it's not impossible. You could actually get a dynamic pressure.
A You could.
Q So if we wanted to do that for some reason -- perhaps we were trying to find out in 2022 whether your line was correct or Mr. Casey's line was correct -- we could do that through a dynamic pressure measurement. Correct?
A After we did that, we would not know which one is correct because this particular model is based on constant porosity, constant permeability, constant thickness. So therefore we're measuring a pressure in an environment and we're simulating a pressure in a different environment.

1263

Q Okay. And I think I understand you that we are making -- we're simplifying reservoir conditions. Is that a characterization of the modeling exercises in this case?
A We are.
Q And instead of considering the entire Cockfield formation as an example, we are considering just 145 features of perforated sand. Is that correct?
A Correct.
Q So in all likelihood, would you agree with me, Mr. Fairchild, that the pressures predicted by this modeling are conservatively high?
A I'm not sure that I can answer that without running it in different -- with a different set of parameters to know whether it's high or whether it's low.
Q Okay. So we could -- let me say it differently.
Do you think the modeling you did is conservative in the sense of it would tend to overestimate pressure build up in the reservoir?
A I don't know that.
Q Okay. Now, I heard -- you were here for Mr. Herber's testimony and we talked about that a moment ago. Did you understand Mr. Herber's testimony as a

1264

geologist that the Cockfield formation is breathing as one. Did you hear that testimony?
A Yes.
Q Okay. That's not what you modeled. Is that correct? You didn't model the Cockfield formation breathing as one. Is that true?
A That's correct.
Q If Mr. Herber is correct and the entirety of the Cockfield formation is breathing as one, would you say that your estimates of pressure, based on your modeling, are conservatively high?
A No, I think it would be -- they would be low.
Q You think the pressures would be low?
A The calculated pressures would be low, because we have a much bigger system that we're -- I mean, we're not just modeling the lower Cockfield. We're modeling the total Cockfield. We could view it as what you would have to do, because it's all talking. So therefore, when I inject, pressure can dissipate beyond just the Lower Cockfield. So, therefore I think it would be low.
Q Well, that's what I'm -- I'm sorry, because I may have confused myself in my question. But let's pick a value from your table -- okay -- from Exhibit 8. After 30 years of injection, constant rates, your modeling predicted somewhere around -- in a dynamic

1265

bottom hole injection pressure of about 4600-psia. Is that correct?
A That's correct.
Q All right. If I understood your last answer, if we considered Mr. Herber's testimony as the geology the way he sees it in the Cockfield formation, that the number would be much lower -- I'm sorry, let me not add the qualifier -- would be lower than 4600 psia as depicted in your exhibit. Correct?
A Are we using a simplistic geologic description?
Q Well, no, actually what I was asking is I thought a moment ago you said the number would be lower, and I'm trying to understand what you meant.
A What Mr. Herber said was -- is that the reservoir breathes, then I'm thinking when he says that he is saying that the Upper Cockfield, the Middle Cockfield and the Lower Cockfield talk to each other. That's in my terminology.
Q Yes, sir.
A So therefore, if I inject in the Lower Cockfield, I would -- and had it breathing, it would then be a model that would allow pressure to dissipate throughout a whole Cockfield and, possibly, the injected fluid to dissipate throughout the whole Cockfield.
Q Okay. I'm asking about pressure. So let's

1266

confine our discussion to the questions asked --
A Okay.
Q -- if that's okay. We had that rule a minute ago. Is that still okay?
A Yes.
Q Yes, sir. We had that develop in our hand signals in the deposition.
So more pressure?
A Yes. You put the same amount of fluid into a bigger tank, the pressure is going to go up less.
Q Okay. So in my way of thinking, coming from the other side, is the numbers would be lower than what you depict in your exhibit?
A The numbers would be lower.
Q All right. Now, we use 145 feet. Even the Lower Cockfield as we've described it, meaning the TexCom application describes it, is greater than 145 feet. Is that correct?
A In gross or net?
Q Let's go with gross.
A Well, I think it's been stated that the -- now you're testing memory --
Q I don't mean to.
A The gross is 145 plus 300 or 145 plus 200. I don't know -- remember whether I'm trying to get to 345

1267

or 445.
Q Okay.
A It's one or the other.
Q The part of the formation we've been discussing in this case called the Cockfield, there's some disagreement of whether there's an upper, middle or lower. You heard that in Mr. Herber's testimony. Right?
A Correct.
Q The part that we called -- we, TexCom the Applicant -- called the Lower Cockfield, do you remember the height, depth, however you like to refer to it of the Lower Cockfield in the area of WDW410?
A Well, the top has been picked at 6045 feet measure depth. And we use 145 feet of net, which is the perforated interval. And I just don't remember off the top of my head whether the gross is plus 300 or plus 200. I think it's plus 300. I think it gets to 445 feet --
Q Okay.
A -- as the gross. So the base of the Lower Cockfield would be 445 foot plus 6,045.
Q I get 6490 if that's correct. Does that seem right?
A That's about right, yeah. I think your math is

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correct.
Q So in the same vein as our discussion a moment ago about pressure, the -- if the pressure dissipated in the Lower Cockfield sand alone, the numbers in your exhibit would be higher than what you'd expect to happen. Is that right?
A No.
Q No?
A No. This particular Exhibit 8 is representing the 145 feet of net sand.
Q Okay. And somehow I keep getting higher or lower wrong, but what I'm trying to say is you have more sand you get lower pressure. Right? If the pressure dissipates in --
A No.
Q No?
A You've got net sand and gross sand. If the gross sand is not taking fluid, then it's the net sand that's controlling the pressure.
Q I'm with you. That's where we started, 145 feet?
A Right.
Q Correct. And that's your modeling model, 145 feet. If the Lower Cockfield or -- is breathing as one, which is a subset of Mr. Herber's testimony, if that's

1269

breathing as one, then you would expect the pressure to be lower than what your modeling predicts. Is that correct?
A It depends on the extra 300 feet. Does it have permeability? Does it have porosity? Is it going to accept fluid when you inject? If it's non-effective rock at the gross, then the answer is pretty much going to be the same.
Q Okay. And that's the gross thing. When we went the other direction and said the Cockfield was breathing as one, all those same things apply. Correct? All the things you just described in the Lower Cockfield and the reason you can't give me an answer there, that's true of the Upper and Middle as well. Correct? It all depends on porosity, all depends on whether the sands are in connection or communication, talking to each other. Is that right?
A We're making the assumption that the Upper and Middle Cockfield has net and gross sand. So the net sand would contribute to the tank, and the net allows the tank to get better -- bigger. And if I put the same volume of injected fluid in, then the pressure is going to go up less.
Q Okay. Now, let's try just a smaller -- a little bit bigger tank -- okay -- which I'll call, for

1270

convenient reference the Lower Cockfield formation as described in the application. That could be a little bit bigger tank than the net sand of 145 feet. Is that correct?
A If that's what a geologist says.
Q And I'm not a geologist, you're not a geologist, so let's work lawyer to engineer. The tank increases same volume regardless of whether we're talking Cockfield formation or anything else for that matter, we would have lower pressure?
A Tank increases not same volume, like you stated, tank increases bigger volume.
Q We're going to come to the volume in a minute.
A Then the pressure will not go as high.
JUDGE EGAN: The pressure will what?
WITNESS FAIRCHILD: Not go as high.
Excuse me, I'm getting away from the mic here.
Q (BY MR. RILEY) What's the magic of the 421 psi number in this case?
A It was a calculation made by TexCom and put in their application. It's the number that they have calculated that if the pressure increases by that amount, and there is a standing column of mud, you'd start moving the mud upward.
Q (BY MR. RILEY) Okay. You and I discussed this

1271

number in your deposition. Do you recall that?
A We did.
Q I think you told me at that time that you had no disagreement with the calculation of TexCom in the 421 psi?
A I haven't calculated it, but it's -- I'm assuming that they did it -- there's kind of some accepted methods for doing that, and I'm assuming they followed that.
Q And again, I -- as brief as you could be, you have no reason to disagree with TexCom's calculation of 421 psi defining the cone of influence, as we have been discussing. Correct?
A No.
Q Okay. Based on your calculations, your modeling -- I shouldn't say calculations -- your modeling, at what distance is the cone of influence located? What radius your WDW410?
A Which model?
Q Sure. Let's go to Exhibit 8. Let's start with Exhibit 8, the modeling scenario depicted in Exhibit 8, which after 30 years, 700-psi greater.
A I didn't pull that information out and plot it.
Q Okay. Can you estimate the cone of influence based on your experience or any other method -- well,

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that's not -- I'll not ask an open question.
Can you look at your exhibit and the data you can gain from that, did you calculate a cone of influence based on your interpretation of how modeling should be done in this case?
A Not for the -- not for the three cases that are presented in Denbury Exhibit 8.
Q Let's look at Exhibit 10. This is sort of the sum-up of your modeling. Is that correct? You have a new entry building on Exhibit 8, if I'm interpreting your graphic depictions, correctly. Is that right?
A It's Exhibit 8 with major changes.
Q Exhibit 8 with major changes.
A I believe that's right.
Q But it's your -- it forms -- and the changes are described in your prefiled testimony, so all I'm just trying to ask right now, this kind of summarizes your prefiled testimony with the way you think the reservoir should be modeled. Is that correct?
A No.
Q That's because you don't believe the reservoir is being realistically modeled in this case. Isn't that right?
A That's correct.
Q But for purposes of this testimony, you've

1273

offered this to the ALJs as your understanding of what the Commission asked the parties, and particularly the Applicant, to go and evaluate again in this proceeding. Is that true?
A No.
Q Okay. Let's start a different direction. What does the red line mean?
A The red line is -- reconstructed the model.
Q Okay.
A In the red line I have got my structure. In the red line I have got my finer grid system. In the red line --
Q Let's go point-by-point. And if you don't mind, I don't mean to interrupt you, but you said you have your structure.
A Right.
Q What specifically is your structure as depicted by the red line in Exhibit 10?
A We took the Geomap and digitized a window out of that map. The WDW410 -- I don't know the size of it. It was bigger than the 10 by 10 that we ended up using. But we digitized that Geomap.
Q I don't want to chase people out of the room again, but are we talking about the Geomap that's been -- that is Denbury Exhibit 17?

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A That's correct.
Q And you digitized that, meaning you turned it into digital information and put it into a computer. Is that right?
A A window out of that we put into XYZ.
Q All right. Now, this is a two-dimensional picture. Correct?
A It is.
Q Snapshot or -- I guess I think of it -- it helps me to think of it as a horizon, particular map of a particular horizon. Correct?
A That's correct.
Q Do you think it's representative of the horizons -- the same horizons in the Lower Cockfield?
A I think it's a reasonable representation.
Q Okay. But would you agree with me that there's room for disagreement there, that someone may -- who has investigated the Lower Cockfield and the area of WDW410 might feel as though -- that this is not a representative -- is not representative of a horizon in that interval?
A At this point, it's the only real map that I think I have. I think it's better than the TexCom map. It's aerially -- the map I generated was more extensive. The XY was bigger. You can always argue as to whether

1275

you can project down some 1300, 1400 feet and did things change. The answer is yes. But it was a -- in our mind -- or in my mind it was a better map than the Casey map.
Q Okay.
A And so we used it.
Q Sure. What map are you referring to as the Casey map --
A The Geomap.
Q No, I know. That part I got. The Casey map is a term you just introduced. Which Casey map are you referring to?
A I guess the only map I can refer to is the map that he depicted in his second engineering report. I believe there's a structure map in there.
Q When you say "second engineering report," are you referring to the fall-off test analysis report or -- I'm not sure what you mean by "second engineering report"?
A I believe he had a -- what I refer to as the second engineering report is the one where he described his modeling of the 80.9 non-transmissive fault.
Q Okay.
A And he wrote it up as a complete re -- engineering report.

1276

Q I think that -- I understand now what you're referring to at least.
A Yes, it's here somewhere.
Q And you think there's a structure map in there?
A Yes.
Q Do you know whether that structure map in the second engineering report was used by Mr. Casey in the BOAST modeling?
A It referenced that that was the structure map that they used, yes.
Q Okay. So on this point you think that the Geomap, which candidly we've seen before in this case because it's in evidence from the prior hearing -- I wish I had it with me -- but the Geomap that you have referred to in your testimony, that's what you used to develop your structure map with the help of Mr. Herber. Is that correct?
A That's correct.
Q So that gives you a -- I guess a variation on the modeling that you think is more appropriate in this case. Is that right?
A That's correct. It gave me -- by doing that, I had more data to the north than you would see in the Casey map.
Q So what does the model do with that structure

1277

map? What does -- what happens in the modeling?
A Okay. We put a box on a map. We had a Denbury employee to digitize it, XYZ, and the -- you put a zero reference. You move over two inches, up an inch, and you read the structure --
Q That's -- I'm sorry. Go ahead.
A -- and how many points we had, I don't know. We then took that digitized file, and that file was provided to Landmark.
Q Okay.
A Landmark is the owner of VIP -- Landmark is a Halliburton company -- and had one of their --
Q Same guys that did that valve -- I'm sorry, I broke the rule. I'm sorry. Excuse me.
JUDGE EGAN: Don't do it again.
MR. RILEY: I apologize.
JUDGE EGAN: I got as far as provided Landmark, the owners of VIP --
A We provided Landmark the digitized file. We prescribed to them how we wanted the grid to be put on that. So you have a grid map -- or you have a structure map. You superimpose on that your simulation grid. They spit back to me the depth structure at each of the grid blocks that we had defined. That was the input that -- into my red line.

1278

Q (BY MR. RILEY) Okay. Did the structure map include faults?
A No.
Q Were there faults in the grid block that you submitted to be digitized?
A I honestly don't know.
Q The grid block --
A Let me -- can I clarify that?
Q Sure.
A They would not have -- I don't believe they would have digitized the fault. They would have digitized -- for every XY that they selected, they would have digitized depth.
Now, if you took that and contoured it -- it might depict a fault in there. But that was not what we were doing.
Q Well, how would the model that you ran have treated a fault if it fell within your grid block area? Suppose there was a fault -- well, let's start a different way.
What is the size of your grid block area that you've been telling us about?
A It's 4400 feet south of the fault. It's about five miles north of the fault.
Q I'm sorry, 4400 feet south to the fault. Is

1279

that correct?
A From the TexCom well --
Q Yes, sir.
A -- south it's about 4400 feet.
Q Okay.
A Which is -- that's the effective grid. It actually goes like five miles, but it's been zeroed out.
So we modeled from the 4400-foot fault. The grid went from there to the well and about five miles north, and then five miles east and five miles west.
Q Now, you heard Mr. Herber's testimony earlier about faults in that area, certainly within the grid block you just described. Correct?
A Did not use them.
Q Did not use them?
A Did not use them.
Q Okay. Am I -- I assume that you -- this red line modeling also used 145 feet as that input. Is that correct?
A It did. It did.
Q So other than -- I suppose the result would be that if a -- if that 145-interval is traveling downward, that might have an effect on pressure. Is that right?
A Yeah, if you go deeper, the pressure is going

1280

to be higher.
Q Right. And it doesn't sound like any detailed structure map was taken into account; namely, faulting or fracturing or anything of that nature. All that was happening was the 145-foot sand that you were evaluating was changing in depth. Correct?
A The top was changing in depth, which I guess the base would change in depth, yes.
Q If we stay at 145 feet, we would hope so. Right?
A That's right.
Q So those 145 feet are changing with topography in the subsurface. Correct?
A Right.
Q Is there anything else that's changing as a result of considering a detailed structure map in this case, in your modeling run?
A We changed the grid. We changed the structure. We were -- from a previous model we were using the analytical aquifer to simulate and got rid of the superporosity. I would have adjusted the PI.
Q The PI?
A PI, productivity index.
Q And tell me what the PI is, sir?
A It's a way -- a simplistic way to say a well

1281

produces. It's barrels per day per psi. So if I get one barrel -- one psi draw down, I'm going to get x barrels a day of production.
Q Okay.
A From the flowing bottom hole pressure -- in modeling it's from the flowing bottom hole pressure to the grid block that the well is in.
Q Okay. I guess I'm having trouble in my head at least, we're talking about injection, not production, as a general matter. Is that right?
A Yeah, let's get the mirror image.
Q Okay.
A The flip flop.
Q Okay. And why did you change the PI?
A In the Casey model they had used a PI of 168. And I felt like that was too big.
Q Too big?
A Too big. Way too big.
Q Well, it just went way too big --
A Yeah, it's way too big.
Q Okay. So what did you change it to?
A So now you want me to define way too big?
Q No, I just want you to tell me what it changed to. I really don't want to know.
A Okay. I actually at that point switched in my

1282

modeling not to use a PI, but to input a WI, which is a well index, in that the well index in the VIP documentation you can calculate a well index, which is a constant something like .26, .29, times the square root of RB over RW plus skin.
Q Plus skin?
A Plus skin, yes. Now, the RB I would have used the Peaceman RB, which accounts for grid block size. In other words, if I've got a well in a hundred-foot grid block or I've got a well in a 10-foot grid block, the RB, if I recall right -- and if you're going to ask me about it, I'd like to look it up -- but it's effectively .14 times the square root of delta x squared plus delta y squared for the grid block. And that's accepted technology from Dr. Don Peaceman.
JUDGE EGAN: Doctor who?
WITNESS FAIRCHILD: Don Peaceman.
THE REPORTER: I'm going to need you to say that equation over again.
(Laughter)
WITNESS FAIRCHILD: Which one? We'll go back to the first one. WI is equal to --
MS. MENDOZA: Can I make a suggestion. Do you think maybe he could write it up there because I also can't figure out whether skin goes on the bottom of

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the equation or the top of the equation. It's up to you, Judge.
JUDGE EGAN: Any objection to him writing his two equations --
MR. RILEY: I have no objection --
WITNESS FAIRCHILD: The only problem is, if I'm going to put it up on the board and you're -- I would like to look it up. If you would like, we can provide that out of the VIP documentation, I believe, if we want to move on.
JUDGE EGAN: Do you --
MR. RILEY: I didn't want to cut the witness off. I'm not interested in pursuing the WI value. I think -- I'm just trying to get a list of differences.
JUDGE EGAN: Okay. Then proceed.
MS. GOSS: I don't think we ever had it repeated for the court reporter.
THE REPORTER: Yes, I was going to point that out.
(Laughter)
WITNESS FAIRCHILD: The WI is equal to -- I think it's .29 times the square root of rB -- you can use a little r, capital B -- divided by RW plus skin. So underneath the square root sign you've got rB rW plus

1284

S. Okay. I think that's right.
Q (BY MR. RILEY) Have you conferred with all the available talent in the room?
A Well, to see whether anybody else knows that equation, and they basically left me hanging out to dry.
(Laughter)
Q (BY MR. RILEY) All right.
A I do believe it's also in the deposition.
JUDGE EGAN: And you needed the next one that he gave?
THE REPORTER: I don't remember anymore. I will --
JUDGE WALSTON: -- confer with him --
THE REPORTER: Yes.
Q (BY MR. RILEY) Do you recall in your deposition when I asked you -- I'm going to find the actual question. It would probably be simpler that way.
I'm going to ask you a series of questions and try to truthfully report your answer from your deposition on May 21, 2010, Page 122 through -- or into 123.
MS. MENDOZA: If you can just give me a moment, I'll get there.
MR. RILEY: Of course.
MS. MENDOZA: We're there. Thank you,

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counsel.
MR. RILEY: You're welcome.
A Do I need it?
Q (BY MR. RILEY) I'm going to read it to you, and if I make a mistake I'm optimistic Ms. Mendoza will point it out to me.
I'm going to start at Line 20.
QUESTION: "And I don't mean to make it too vague. When I say anywhere close, I mean -- I'm not asking for would I get 80.9 -- would I get 1200?"
ANSWER: "Well if you want me to fast-forward to 2009, that test was run, the injectivity then test got reportedly --"
MS. MENDOZA: I'm sorry, I pulled up the wrong deposition. I'm very sorry.
MR. RILEY: That's okay. I'll start it again.
MS. MENDOZA: I was reading Page 122 out of a different deposition, and it just didn't track.
Thank you.
Q (BY MR. RILEY) I'm going to begin again on Line 23, if that's okay.
ANSWER: "Well, if you want to me fast-forward to 2009, that test that was run, the injectivity then test got reportedly -- something

1286

interpreted 190 millidarcies. I would disagree, and I know Peter would disagree with that particular -- that interpretation. It appears as though they used the wrong viscosity."
Do you remember being asked that question and giving that answer?
A I do.
Q Continuing on then, Line 4.
QUESTION: "What is your opinion, then, based on the September '09 test of the permeability of the Lower Cockfield."
ANSWER: "It's more like the 80."
Did I read that correctly?
MS. MENDOZA: He can't. He doesn't have the deposition.
Q (BY MR. RILEY) I'm sorry. Do you recall being asked that question and giving that answer?
A No. And I have not interpreted the -- we are talking 2009?
Q Well, that's -- let me show it to you then.
A Page --
Q Now that I don't have it, I think it's 122 going into --
JUDGE EGAN: Line 23.
MS. MENDOZA: He started at 122 page --

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Line 23, but he's at the top of page 123, question beginning on 4.
A Okay. Excuse me, I thought you said a minute ago it's more like eight, e-i-g-h-t.
Q I'm sorry.
A I misunderstood you. It's more like 80.
MR. RILEY: I apologize. That's certainly not what I was hoping to say.
JUDGE EGAN: That's okay.
A At 80 we're in the same ball park.
Q (BY MR. RILEY) Okay. So that testimony is accurate?
A Yeah.
Q It's correct?
A Yes.
Q Thank you, sir. Without giving you the wrong impression from my question, is it true that you did not model this aquifer the way you believe it behaves in reality? Is that correct?
I'm sorry, I said aquifer, this formation. Is that better?
A Depending on the objective of your modeling, if we're talking -- well, can you give me the objective of the modeling?
Q Sure. Let's say we're trying to accurately

1288

predict, with the tools we have available, and looking forward for -- to predict 30 years out from today what a reservoir would do, what this reservoir would do, if TexCom were to inject for 30 years at maximum rates, and that's the objective of the model. Is that okay?

A Okay. If --

Q I'm sorry, let me just --

A I thought you had finished.

Q Let me polish it a little bit so we can get a clear answer. The objective is to be conservative but not unrealistic also. Is that fair?

A I think you've got conflicting statements.

Q Okay. Well, tell me -- I mean, one could model, for instance, a pressure that -- well, let's see. We can set up a model to be too conservative. Would you agree with me?

A Of course.

Q Okay. So using that as a foundation for this line of questions, there's a model that -- if I asked you to construct an overly conservative model, you could construct it for me. Correct?

A To construct an overly conservative model says that I have to know maybe what the real answer is so I give it data to be conservative. And overly conservative, 10 percent, 20 percent, 100 percent -- you

1289

didn't define overly.

Q Okay. For instance, we've been trying to -- we've been struggling with modeling in this case. We've used different models. We've had different experts. And fundamentally, there's a lot of conservative assumptions made in the modeling in this case -- is that right -- whether it's your modeling, Mr. Casey's modeling, the TCEQ's modeling. Would you agree with that statement?

A Yes, I do believe it's been conservative.

Q For instance, it's my understanding it is -- you share the opinion of Denbury's geologists that the 4400-foot fault is transmissive at least in the horizontal direction. Do you share that opinion?

A At least in the horizontal.

Q Is it also your opinion that there's potential for vertical transmissivity in the Cockfield sands in the area of WDW410?

A The potential is there.

Q (BY MR. RILEY) Were you there -- this may not be in your area of expertise. Were you here when there was a rule of thumb offered that vertical transmissivity is about an order of magnitude less than horizontal, transmissivity as a rule of thumb?

A As it references to modeling, yes, I did hear

1290

that testimony.

Q Do you agree with it as a rule of thumb?

A Not in modeling.

Q Not in modeling. Okay. But in terms of reality?

A It's a field zone. It's case specific.

Q Okay. In this case, do you have any opinion as to the vertical transmissivity as compared to the horizontal transmissivity in the sands that are perforated?

A No, no data.

Q Wouldn't the fall-off test provide some data in that regard?

A Vertical permeability? No.

Q Okay. If one opened up the fault, so to speak, in your model, took the steel plate out, would you expect your pressures to be lower, the predicted pressures to be lower?

A My model isn't structured to do that. But in general, if you add more volume, volume south of the fault, the pressures will be lower.

Q And when you said your model isn't structured to do that, did you mean that that's because of the inputs as you set them up. Is that right?

A Right.

1291

Q So if you took that input out and opened it up -- or took the steel plate out, as I described it -- in your model, would you expect your predicted pressures to be lower than what you've represented in your exhibits?

A If I was going to do that exercise, I would want to have the structure south of the fault to represent the real structure south of the fault, which it doesn't now.

Q Okay.

A Therefore I would be on depth.

Q You would be -- I'm sorry?

A On depth. My depth would be correct. Right now in my model, I do not look at the structure south of the fault.

Q And I'm with you. So your model doesn't take -- doesn't contemplate either existing or future production from the Conroe Field. Is that true?

A No, it doesn't.

Q So somewhere back in the course of time there was a question of whether Denbury should be admitted as a party in this case, and a question was raised regarding whether Denbury's operations, existing or future, might impact the modeling in this case. You may not know that. Are you aware of?

1292

A Might impact what?
Q The modeling in this case.
A I can't speak to that.
Q You can't speak to it. You're not aware of that one way or the --
A I'm not aware one way or the other.
Q Okay. But your modeling simply does not consider Denbury's activities in any way in the reported result. Is that correct?
A Correct.
Q I just have one more line of questions, should be a few minutes.
You look surprised. Are you?
A I'm very surprised.
(Laughter)
And relieved.
Q (BY MR. RILEY) I'd asked you some questions this morning about calculating a bottom hole pressure.
A Correct.
Q And before we go on, I -- are these calculations in your model, at least the starting point, indicative of a bottom hole pressure?
A Are you referring to a particular graph or what?
Q Yes, sir, I'm looking at -- well, we can pick

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any one because they all sort of start at the same point. But it says bottom hole injection pressure.
A Correct.
Q Okay. And it seems like there's at least some data point in year zero related to bottom hole pressure.
A About 2500 pounds. Correct.
Q Do you know the fracture pressure of the Cockfield sands that we're discussing in this case, particular in the WDW410?
A No. I know that TexCom, through their application, has done a calculation using the Eaton's equation for frac pressure.
Q Is that a valid equation to use for frac pressure?
A It's an accepted equation.
Q Any reason to disagree with TexCom's calculation of frac pressure?
A Ask that again, please?
Q Do you have any reason to disagree with TexCom's calculated fracture pressure in this case?
A I really haven't looked at it. I know it's in one of the documents, and that's it.
Q It's an important number, isn't it for UIC permitting purposes?
A Correct.

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Q And you don't want to fracture the formation, the injection -- the injection zone. Correct?
A I would hope you wouldn't.
Q All right. And would you expect TCEQ is very careful about that number?
A I believe so.
Q And in your experience then, is the fracture pressure really the driver for setting the surface injection pressure?
A Yes.
Q If I'm understanding how it's done then, one calculates a fracture pressure of the injection interval, let's call it, and then that calculates or works backwards to set a limitation at the surface injection pressure. Is that right?
A Yes.
Q Do you know whether -- and in this case that ends up being 1250 psi. Is that correct?
A That's correct.
Q Do you know whether that 1250 psi number is conservatively calculated?
A Since I don't know exactly what parameters was used to calculate it, I don't know whether it's conservative or not conservative.
Q And that's fair. I just want to make sure we

1295

were clear.
A Yeah.
Q As I understood our conversations in your deposition, the pressures you predict through your various scenarios could not be achieved without exceeding frac pressure at the wellbore. Is that correct?
A That's correct.
Q And if that number at the top of the hole or the surface pressure injection is correctly calculated, that means the pressure in the wellbore could not reach the levels necessary to validate or give you the pressure readings at distance that you predict in your modeling. Is that true?
A Not necessarily.
Q Okay. So you think that with the 1200 psi limitation -- injection pressure limitation --
A 1250.
Q I'm sorry. Did I say 1200? I'm sorry -- 1250 psi limitation at surface that one could reach a pressure at the bottom of the hole that would yield the pressures you predict in your modeling and in the various scenarios after the base case?
A May I explain how I ran the model?
Q Can you answer my question first, then maybe

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we'll get to that.
A Repeat your question.
Q Sure. I'm imagining -- let me try -- maybe if I approach it differently, we can get there.
I'm imagining that one could correlate your data points -- in other words, your predicted outcome, say, in Exhibit 8 -- could work backwards to predict a bottom hole pressure at the well. Is that correct?
A No, this is the bottom hole pressure at the well.
Q Okay. So the bottom hole pressure at the well is -- I thought this varied over time, so what I'm trying to figure out is in year 30 the bottom hole pressure at the well is 4600 -- I'm sorry, I'll try to be more careful here. It's a little north of 4600 psia in Exhibit A. Is that correct?
A Correct.
Q In order to -- if I'm understanding then -- please tell me if I'm not -- then I could read off this chart what the bottom hole pressure would need to be in order to create the pressure that's predicted in the 30-year interval. Is that right?
A I don't think I understand your question.
Q I guess what I'm trying to do -- and let me see

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if I can approach it just as straightforwardly as I can --
A I can explain it, if you want me to tell you what you're trying to do.
Q I'll tell you what, let's wing it. It's not -- it's not within the rules, but if you could explain what I'm trying to say, the let's go for it.
A In the model, for a well, you've got what we call boundary conditions. You can give it a rate boundary condition or you can give it a pressure boundary condition, or you can give it a mix. I allowed the model to violate the pressure boundary condition in that at distance from that well if I'm -- go greater than -- well, if the pressure goes too high, it says the rate's got to back off. I didn't want to do that. I wanted to put in the 12,000 barrels a day every day all day. So, therefore, I wasn't really concerning myself with that pressure, knowing that in the real world we could either add perforations to get more injectivity or we could drill another well. And at distance from the well, it's not going to make that much difference.
Q Okay.
A So --
Q Well, now I am going to cut you off. I think I've gotten what I was looking for.

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A And I think I confused you.
Q Actually, I think you explained it to me better.
A Okay.
Q What you did -- you didn't limit your modeling then to the 1250 psi injection pressure.
A I did not. In fact, my explanation was wrong.
Q Just when I began to understand it. Okay. Let's not get too silly because I really do want to finish with this examination.
Your company did the evaluation of the 1999 fall-off test information. Is that correct?
A We did an evaluation, yes.
Q And you did a report as a result of your work. Correct?
A Yes, we did.
Q You provided that report to your client or Mr. Roth. Is that the individual?
A That's correct.
Q And you made a determination that there were no boundaries in the area of investigation. Isn't that true?
A I think I've stated that. I don't think the report says that.
Q Okay. I think -- but either way, your

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company's evaluation -- what was the radius of investigation in the -- let's call that the Crossroads fall-off test.
A I don't know that we even reported a radius investigation to my knowledge. But with the data that's there, you could calculate one or somebody could calculate one.
Q I think at least one witness in this case, Mr. Grant, said something in the order of 1500 feet or something on that --
A That may be.
Q So my understanding then, in terms of interpretation of fall-off test data done by your company, you found no -- I guess one witness referred to them as anomalies -- in the radius of investigation based on Crossroads testing. Is that true?
A I don't believe we saw anything. That's correct.
MR. RILEY: Thank you. Pass the witness.
MS. GOSS: No questions.
MS. MENDOZA: Your Honor, would it be possible for us to take a short break and I can try to narrow down exactly what we need to cover?
JUDGE EGAN: Come back at 10 'til 3:00.
(Recess: 2:33 p.m. to 2:50 p.m.)

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(The following pages, ^through , are Denbury Onshore, LLC Offer of Proof.)

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DENBURY ONSHORE, LLC OFFER OF PROOF

SOAH DOCKET NO. 582-07-2673
SOAH DOCKET NO. 582-07.2674

TCEQ DOCKET NO. 2007-0204-WDW
TCEQ DOCKET NO. 2007-0362-IHW

TUESDAY, JUNE 22, 2010

1302

(Witness Powell sworn)
(Exhibit Denbury No. 24 marked)
PRESENTATION ON BEHALF OF
DENBURY OFFSHORE, LLC
DENNIS RAY POWELL,
having been first duly sworn, testified as follows:
DIRECT EXAMINATION
BY MS. MENDOZA:
Q Mr. Powell, I'm handing you Denbury Exhibit 24. Can you identify that for me?
A This is a -- this?
Q Yes.
A This is sworn testimony that I gave you the other day.
Q Okay. Does that reflect the testimony that you intended to give today?
A Yes.
Q Are there any corrections that you need to make to that testimony?
A No.
Q Do you adopt this testimony as though you were giving it live today?
A Yes, I do.
MS. MENDOZA: Denbury offers for admission Denbury Exhibit 24.

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And that completes our offer of proof.
(Denbury Offer of Proof concluded)

1304

JUDGE EGAN: We'll get back on the record, and I believe we were back to redirect.

Ms. Mendoza?

MS. MENDOZA: I just have a few questions.

REDIRECT EXAMINATION

BY MS. MENDOZA:

Q You had talked with Mr. Riley about the boundary conditions that were used in your model versus the boundary conditions that I believe you indicated were used in Mr. Casey's model, the superporosity versus the analytical aquifer. What was the effect of having superporosity on pressure? Did it tend to underestimate the pressure or overestimate the pressure?

A Kept pressures lower, bigger tank to inject into.

Q And what was the result of moving -- what would be the result of moving from, say, a closed boundary system to superporosity? Would it make the pressures lower or would it make the pressures higher?

A They would go up.

Q I'm sorry, moving from a closed boundary to superporosity would increase the pressures?

A Right. Going from closed boundary to superporosity, so we go to superporosity, the tank gets bigger so the pressures will go down.

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Q I just wanted to talk very briefly about the last set of questions we had there about modeling one well versus modeling four wells and what that did. At a distance from the well, does the choice of one well versus four wells make a significant difference --

A No --

Q -- in pressure?

A -- at a distance from the well it's basically the volume that you inject it. If you had four wells, it's going to look, at a distance from the well, like it's just a big and large wellbore.

Q So to the extent your testimony was presenting testimony about pressures at a distance from the well, the difference between one well and four wells doesn't make a difference?

A Very little.

Q Okay. And then the last thing that I wanted to ask, in estimating the pressures in the reservoir -- in estimating the pressures in the borehole, what was the -- did choosing a large PI number lower the pressure or did it raise the pressure near the wellbore?

A It would keep the pressure down. It would reduce the delta p in the near wellbore.

MS. MENDOZA: We pass the witness.

MR. HILL: No questions.

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JUDGE EGAN: Mr. Forsberg?

MR. FORSBERG: No questions.

JUDGE EGAN: Mr. Walker?

MR. WALKER: No questions, Your Honor.

MR. HUMPRHEY: No questions.

JUDGE EGAN: Mr. Riley?

MR. RILEY: Just a few.

RECROSS-EXAMINATION

BY MR. RILEY:

Q Ms. Mendoza just asked you about the boundary condition, and there seems to be some dispute as -- among experts in this case as to how to model using BOAST or VIP in modeling the boundary condition. Can we agree on that?

A It has nothing to do with BOAST or VIP.

Q I understand that.

A But it's the methodology of how you model a boundary.

Q And how do you model a boundary in PRESS2?

A You don't. It's an infinite system.

Q So the PRESS2 modeling relied upon by TCEQ is a valid form of modeling. Would you agree?

A It's a valid model for the basis for which it was developed.

Q And that's the basis for which we are here, at

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least as TCEQ sees it, they used PRESS2. Is that your understanding?

A Right. That's a solution to the theis equation.

Q And the boundary condition discussion we're having is relevant only to a finite difference model. Is that correct?

A No.

Q I'm sorry. In terms of -- as between --

A Well, you don't have infinite boundaries in a finite difference model. So, therefore, we're talking -- that's the reason we're talking about them.

Q Right.

A But I guess you could. You could grid out to Houston or something like that and then you could do it all within finite difference.

Q If one were trying to compare modeling results between a finite difference model and PRESS2, would superporosity make sense in that context?

A No.

Q You applied an analytical model at the boundary in your VIP modeling. Correct?

A Correct, Carter-Tracy.

JUDGE EGAN: I'm sorry?

WITNESS FAIRCHILD: A Carter-Tracy.

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Q (BY MR. RILEY) Why didn't you use -- could Carter-Tracy be used from the wellbore without independently -- or independent of a finite difference model could you just run a Carter-Tracy solution and model a reservoir?
A Whether you could, I'd have to think about that. Whether I ever have, the answer is no.
Q But you have used analytical models in your work?
A Yes.
Q Is Carter-Tracy different from the analytical model we've been discussing PRESS2?
A Yes.
Q Okay. In terms of -- I'm sorry, because differences are a hard thing to get at -- but one is an analytical model -- Carter-Tracy is an analytical model. Correct?
A It's an model, yes.
Q Okay. And PRESS2 is an analytical model. Correct?
A Correct.
Q And there may -- they may operate differently, but they -- would they mimic each other if you were to use Carter-Tracy in place of PRESS2?
A I've never done that, but maybe it could. I

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don't know.
Q Well, you mentioned a few different types of analytical models. Pie (phonetic) I think was one of them. Am I correct?
A Correct.
MS. MENDOZA: Your Honor, this is getting pretty far afield from a fairly narrow redirect.
JUDGE EGAN: I agree --
MR. RILEY: Okay. Thank you. I'll move on.
JUDGE EGAN: -- please.
MR. RILEY: I will. Nothing further. Thank you.
MS. GOSS: No questions, Your Honor.
JUDGE WALSTON: Let me ask one quick clarifying question.

CLARIFYING EXAMINATION

BY JUDGE WALSTON:
Q When you say PRESS2 is an infinite system, do I understand that to mean that it effectively does not have an outer boundary or it's an open boundary?
A Correct.
JUDGE WALSTON: Okay.
JUDGE EGAN: All right. Any questions given the Judge's question?

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(No audible response)
No? All right.
WITNESS FAIRCHILD: I'm going to give the court reporter the two equations. Do you want me to have -- give them to everybody?
MR. RILEY: I've got to say, yeah, I'd like to see them, but I can get it from the court reporter at some appropriate time so we don't delay the proceedings.
WITNESS FAIRCHILD: No, I'm going to have to log on to get those, and I'll do that.
MR. RILEY: Okay.
JUDGE EGAN: All right.
WITNESS FAIRCHILD: Thank you. You're excused.
Ready to call your -- oh, I'm sorry.
MS. FORLANO: Aligned Protestants have both of their remaining two witnesses here, and I believe that all of the parties have agreed to go ahead and take them out of order once Mr. Fairchild was finished.
JUDGE EGAN: Is that agreeable?
MR. RILEY: It is.
JUDGE EGAN: Then would you like to --
MS. FORLANO: I'd like to call Dr. Bill

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Wilder.
JUDGE EGAN: Just a second.
MR. RILEY: If it's not a great inconvenience, could we switch the order because we were going to alternate --
MS. FORLANO: Yes. I was just trying to get Dr. Wilder out of here because I think -- if he doesn't get home soon, his wife and his doctor will both have me arrested.
MR. RILEY: Well, I don't want to see that happen, but I think we'll be brief with both witnesses.
MS. FORLANO: Okay. Well, then, Dr. Bill sit down and we'll call Melvin Solomon.
(Witness Solomon sworn)
MR. WALKER: May I proceed, Your Honor?
JUDGE EGAN: Yes, you may.

PRESENTATION ON BEHALF OF
ALIGNED PROTESTANTS (CONTINUED)

MELVIN PAUL SOLOMON,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. WALKER:
Q Would you state your name for the record, please, sir?
A Melvin Paul Solomon.

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Q Mr. Solomon, if you would take a look at the materials in front of you there, and do you see the Exhibit No. 5, your prefiled testimony?
A Yes, sir.
Q Do you see Exhibits 6, 7 and 8, documents from the City of Conroe Wastewater Treatment Facility and their permit?
A Yes, sir.
Q And a copy of the city ordinance?
A Yes, sir.
Q All right. Have you had an opportunity prior to today to review your prefiled testimony and those exhibits, sir?
A Yes, sir.
Q Do you adopt, Mr. Solomon, your prefiled testimony and those Exhibits 6, 7 and 8 -- and, of course, the testimony is No. 5 -- as your testimony just as if you were presently giving it live today?
A Yes, sir.
MR. WALKER: With that, Your Honor, we will offer -- I'm sorry?
JUDGE EGAN: I didn't say anything.
WITNESS SOLOMON: Unfortunately I coughed. I'm sorry.
MR. WALKER: With that, Your Honor, we

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will -- Aligned Protestants will offer into evidence Exhibits 5, 6, 7 and 8, and we will pass the witness.
JUDGE EGAN: Aligned Protestants-5, 6, 7 and 8 are admitted.
(Exhibit AP Nos. 5 through 8 admitted).
JUDGE EGAN: All right. I guess we can start with Lone Star.
MR. HILL: No questions, Your Honor.
JUDGE EGAN: Mr. Forsberg for the Individual Protestants?
MR. FORSBERG: Just a couple of brief questions, Your Honor.

CROSS-EXAMINATION

BY MR. FORSBERG:
Q Good afternoon, Mr. Solomon.
A Good afternoon.
Q In reading your testimony, am I to understand that if a waste generator wants to dispose of waste at your -- or at the facility in Conroe, they have to provide some basic information or detailed information to you?
A Yes, sir.
Q Okay. And attached to your prefiled testimony as Exhibit No. 6 is something called a Wastewater Data Disclosure Form. Do you see that in front of you?

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A Yes, sir.
Q Is this a form that any waste generator of Class 1 material wanting to dispose of such material in your facility that they would have to fill out completely and provide to you?
A Yes, sir.
Q If you could turn to Page 12 of that -- of Exhibit 6. It's Page 12 of 20. Do you have that in front of you?
A Yes, sir.
Q This is a list, it appears, of various materials that could be part of a wastestream. Is that correct?
A Yes, sir.
Q What does someone wanting to dispose of what -- to dispose of waste at your facility, what do they have to do with this form?
A They have to run a test using the one -- sub 36 rules from the 40 CFRs.
Q Okay. That's the federal regulation?
A Yes, sir, the methods out of it.
Q And, for example, this list includes things like arsenic. Correct?
A Yes, sir. That's a local limit.
Q Okay. If a potential disposer of any of the

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Class 1 waste streams came to you with this form filled out and arsenic was at a level you felt was too high, could you reject that waste?
A Yes, sir.
Q Are there other alternative locations where, that kind of waste, you could then direct the disposer of the waste or other facilities?
A We don't recommend.
Q Okay. If you could turn to Page 17 of 20 of that same exhibit?
A (Witness complies)
Q Do you see that page?
A Yes, sir.
Q Is this also a list of chemicals that a potential disposer would have to identify if these items are potentially going to be in their waste stream?
A Yes, sir.
Q And again, if there was something about this form that concerns you, you at this wastewater treatment facility could then reject the waste?
A Yes, sir, we could.
MR. FORSBERG: I'll pass the witness.
UNIDENTIFIED SPEAKER: No questions, Your Honor.
JUDGE EGAN: Office of Public Interest?

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MR. HUMPRHEY: No questions, Your Honor.
JUDGE EGAN: Mr. Moore?
MR. MOORE: Yes. Thank you, Your Honor.
CROSS-EXAMINATION
BY MR. MOORE:
Q Good afternoon, Mr. Solomon.
A Good afternoon.
Q I understand from your prefiled testimony that you're here today testifying in your capacity as the Assistant Plant Superintendent/Pretreatment Coordinator for the City of Conroe's wastewater treatment facility. Is that correct?
A Yes, sir.
Q And I'm going to ask you, if you would, just take off your City of Conroe Wastewater Treatment Facility hat for a second. I want to ask you about your personal opinion.
Are you personally, Mr. Solomon, opposed to TexCom's applications?
A I really hadn't thought about it.
Q Okay. And do you live near the proposed site of the TexCom facility?
A I live in the City of Conroe.
Q Have you reviewed TexCom's application?
A No, sir.

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Q And in your prefiled testimony you talk about industrial users of the POTW. Is that a fair statement?
A Yes, sir.
Q And when I refer to the POTW or the wastewater treatment plant, if we could have an understanding that I'm referring -- unless I say otherwise -- to the City of Conroe's wastewater treatment plant. Okay?
A Yes, sir.
Q Okay. And an industrial user, as that term is understood by yourself, that is simply any industry that generates a wastewater. Correct?
A Yes, sir.
Q Is the POTW -- is the City of Conroe's wastewater treatment plant actively seeking out new industrial customers?
A What do you mean by "actively"?
Q Are you looking to sign up new industrial users?
A Anyone that comes into the City of Conroe, yes, sir.
Q Do you go knocking on their door when they come into the City of Conroe or do you wait for them to knock on your door?
A When they apply for a wastewater discharge permit, then that's when I send them the information

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out.
Q Okay.
A Because I have to approve that.
Q The City -- does the City make money off of their industrial users of the POTW?
A We break even.
Q And would that -- would you still break even if you had twice as many POTW -- industrial users tomorrow as you do today?
A Yes, sir.
Q Let's talk a little bit about the industrial users that you do have today. I understand from your prefiled testimony that the POTW currently has ten industrial users?
A Yes, sir.
Q Is that all of the industries generating wastewater in the Conroe area?
A No, sir.
Q How many more industries that generate wastewater in the Conroe area are there?
A Several. I can't name the number. I haven't ever counted.
Q More than 10?
A Probably more than 10.
Q More than 20?

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A I can't give you a number on that. I haven't counted them.
Q If I'm an industry and I locate in the Conroe area, how do I go about connecting, if you will, to the POTW?
A First of all, you have to go into the building permits and apply for a building permit, and then that starts the process.
Q Okay. And I take it, then, from your prefiled testimony the POTW doesn't accept hauled waste. Correct?
A Hauled waste -- just hauled waste, except to a point designated by the POTW.
Q Okay. So I couldn't load up, say, a vacuum truck, take it to the POTW and hose it in?
A No, sir.
Q Okay. So I have to connect into a sewer line. Is that fair?
A Yes, sir.
Q What is the aerial extent of the area that can be served by the City of Conroe wastewater treatment plant?
A We have a proximity of all the way down to 242 north to the City of Willis, west almost to Montgomery, east to Cut and Shoot.

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Q Okay. I won't even pretend like I know that area very well. But if you can answer this for me: Does the aerial extent of the area that can be served by the City of Conroe POTW, does it include all of Montgomery County?
A No, sir.
Q Does it include half of Montgomery County?
A I don't think so, no, sir.
Q Does the City of Conroe's wastewater treatment plant -- do you have a CCN?
A Yes, sir, we do.
Q And for the benefit of everybody that might not know what a CCN is, can you tell us what the stands for and what it is?
A A certificate of convenience and necessity.
Q So a certificate of convenience and necessity?
A Yes. That kind of defines our service area that we're going to service.
Q You cannot serve anyone that's located outside of that CCN via sewer pipe?
A Via sewer pipe, yeah.
Q Is the -- is Huntsman -- are you familiar with Huntsman the company?
A Yes, sir.
Q Okay. Does Huntsman have a facility located

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within the bounds of your CCN?
A I really don't know. I did not look that information up.
Q Okay. Do you know where the Huntsman facility is located, whether it's in your CCN or not?
A I can't say. I don't know what the boundaries of CCN say.
Q I think I know the answer, but I'll ask: Do you know how many industrial users there are in Montgomery County that you cannot serve, i.e. that are outside of the bounds of your CCN?
A No, sir, I do not.
Q We're talking about connecting into a sewer line to get industrial waste to the POTW. Are those below ground sewer lines?
A Yes, sir.
Q And how deep, if you know, in general are the sewer lines buried that serve the POTW?
A The ones coming to the plant are normally about from 20 to 15 feet.
Q In your prefiled testimony you talk about the POTW treating the -- I'll call it the influent into the plant. Do you know what I'm talking about when I refer to influent?
A Yes, sir.

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Q And the effluent would be what the POTW discharges out of the plant. Correct?
A Yes, sir.
Q As it concerns the effluent, the permit for the POTW does not require the POTW's effluent to be entirely free of contaminants, does it?
A No, sir.
Q So there's some amount of contamination, if you will, that is allowed in the daily discharge from the POTW?
A Yes, sir.
Q You also talk about monitoring of the -- of the effluent and the -- I'll call it the wastewaters in process in the POTW, and I want to talk a bit about those monitoring requirements for each of those streams. As it concerns the effluent, with what frequency are you required to monitor?
A Some parameters daily, some parameters every three months, and some parameters once a year.
Q Okay. And I want to take the daily first. The POTW's permit is in Exhibit 7 to your testimony. Correct?
A Yes, sir.
Q If you would, please point us to the requirement that concerns the daily monitoring of the

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effluent.
A They are listed on Page 2.
Q Okay. And so looking at this, am I correct that as it concerns the daily monitoring of the effluent, the POTW is required to monitor for BOD, which is biological oxygen demand. Correct?
A Yes, sir.
Q And then total suspended solids?
A Yes, sir.
Q And then ammonia nitrate --
A Nitrogen.
Q -- nitrogen, sorry -- and E. coli. Correct?
A Yes, sir.
Q Is there anything else that you're required to monitor your effluent on on a daily basis?
A We also report total chlorides.
Q Total chlorides. Okay.
On a three-month basis where are -- if you could do the same thing and point us to the requirement for that?
A They're on Page 21.
Q Okay. I take it from the title of Section 3 on this page that these three-month requirements apply to the sewage sludge that you will generate at the POTW?
A Well, the sewer sludge is also included in our

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discharge out. It's influent, effluent and sludge.
Q Okay. I don't know that I --
A We have to do testing every three months on the influent stream coming in, the effluent stream going out and the sludge.
Q Okay. And what parameters do you have to test the influent, effluent and sludge every three months for?
A The Table 3 pollutants that are listed in the 40 CFRs.
Q Okay. And is that table replicated anywhere in -- either the City of Conroe's ordinance? Is it in there?
A No, sir.
Q Okay. Is the Table 3 -- is Table 3 in the permit anywhere?
A It's just listed. It's just --
Q The word Table 3 is listed?
A Right.
Q But we don't have in front of us at least in your prefiled testimony and exhibits the list of pollutants, if you will, that are on Table 3?
A No, sir.
Q And then I think the last thing that you mentioned was a one-year monitoring --

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A It's also in this section --
Q Okay.
A -- that we're looking at.
Q So here on Page 21 would have the one-year requirement too.
A Yes, sir, if you'll look on D --
Q Okay.
A -- that shows the TCLP, which is the sludge there, and also the Appendix 2.
Q Okay. And just so I can follow along back at the office when I need to, will you show me where on here on Page 21 it speaks in terms of the effluent and the influent -- I certainly see where it talks about testing of sewage sludge -- where it talks about testing of the effluent and influent?
A It may not be listed directly saying that, but that's what it infers.
Q Okay. So that's how you read this provision is that you need to test your influent and your effluent, not just your sewage sludge every three months.
A It's a requirement, yes, sir.
Q Now, I believe Mr. Forsberg pointed you to a list of contaminants -- to us of contaminants, and the first one being on -- in Exhibit 6 on Page 2 of 20 --
A Yes, sir.

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Q Okay. We talked about BOD already, so we can check that one off the list of what I'm about to ask you about. And total suspended solids we talked about as well. Okay? As it concerns the pollutants, which includes even temperature on this list, how frequently do you test for each one of these in your -- let's just take the effluent?
A The BOD -- of course the total suspended solids, every day.
Q Okay.
A That's there. The oil and grease, we do it every three months.
Q Okay.
A The local limits is also every three months.
Q And when you say the local limits, is that for all the metals that we see listed there?
A Yes, sir.
Q Okay. Anything else? We've got toxic organic compounds, solvents, flammable explosives, that type of thing?
A That just refers to the industrial. We do not test them at the plant.
Q Okay. So you don't test the effluent for TOC?
A No, sir.
Q Okay. And up at the top, how about temperature

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and pH. Is there any testing of that?
A The pH is done daily.
Q Daily? Okay. And temperature?
A Temperature is just -- that's one of the things listed in the prohibited aspects in the -- any industrial permit.
Q Okay. All right. The other list that I wanted to talk with you about is on Page 17 of 20. This is a rather long one. I guess the easiest way to approach this is do you test for each and every one of the -- what are referred to as priority pollutants on this list?
A Yes, sir. That's done once a year.
Q Once a year. Okay. And is that done of the influent, effluent and sludge?
A Yes, sir.
Q Okay. Pretreatment. You discuss pretreatment at various parts in your prefiled testimony. Correct?
A Yes, sir.
Q And is it fair to say that -- well, I understand that you go out once a year and inspect the pretreatment program that -- or the pretreatment programs that may be in use at each of your industrial users. Is that correct?
A Minimum of once a year.

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Q Minimum of once per year. Okay. Is it fair to say that the POTW relies upon its industrial users to meet their pretreatment requirements on a day-to-day basis?
A Require --
Q I'll say it again. Is it fair to say that the POTW has to rely upon its industrial users to meet their pretreatment requirements on a day-to-day basis since you inspect once a year?
A They help us meet it, yes.
Q Do you do any daily monitoring of the influent into the POTW?
A No, sir.
Q What -- if I'm an industrial user, what level do I have to treat my waste down to, if you will. Let's say I have a Class 1 waste. Do you understand what a Class 1 waste is?
A Yes, sir.
Q Do I have to treat it down to Class 1 standards, Class 2 standard?
A No, sir.
Q Okay. Do I have to treat it down to Class 3 standards?
A Just depends -- it just depends on the industry and what kind of waste they have.

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Q So the pretreatment requirements for each industrial user are going to vary with the constituents that may be in the waste stream to each individual user?
A Right.
Q And is it the case that one industrial user may have multiple pretreatment programs in place to meet the pretreatment requirements?
A They could have various ways to reduce their waste stream, yes.
Q And I take it that -- you told me early on in our time together that you haven't reviewed TexCom's applications. Correct?
A No, sir, I have not.
Q So you're not familiar with the waste streams that TexCom proposes to accept, are you?
A I do not.
Q And it follows from that then that you wouldn't be able to tell us what pretreatment programs would be required for each of those waste streams?
A No, sir.
Q Does pretreatment generally produce a waste?
A Well, I'm not quite sure I understand what --
Q Let me step back. My understanding of the gist, if you will, of pretreatment is we need to take out some concentration of various different contaminants

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out of the wastewater stream before the industrial user sends it to the POTW?
A Right.
Q And in the process of doing that, removing those contaminants from the wastewater stream, will the industrial user typically generate a waste that it cannot send to you the POTW?
A Yes, sir.
Q And what -- in your experience, what typically does the industrial user do with that waste stream?
A They normally take it to a hazardous waste receiver.
Q I think you covered this with Mr. Forsberg, but I want to make sure I understand as well, too. Say I'm an industrial user and I move into the City of Conroe or I move into the area covered by your CCN and it happens to be an area where I can hook into the sewer system. Simply because I generate a wastewater stream does not mean that you are necessarily going to accept my wastewater for discharge, does it?
A Not necessarily, no.
Q So there may be some industrial users who cannot use your POTW?
A True.
Q Is it also the case that you may look at the

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waste stream that the potential industrial user is going to send to the POTW and say, "We can take that, but we can't take it in the quantities that you're generating. So we're only going to be able to take 75 percent of your wastewater."
A Yes, sir.
Q Have you done any analysis of the cost to the industrial user of using the City of Conroe's POTW versus using TexCom's facilities?
A I gave some figures in my deposition of the -- about the cost of what it --
Q Okay. Just so the record is clear, I think you referred to a deposition --
A The deposition, I'm sorry.
Q -- your prefiled testimony. Correct?
A Prefiled.
Q And if I recall your prefiled testimony, you gave figures for the cost of using the POTW. Correct?
A Right.
Q But I don't believe you gave any figures for the cost of using TexCom's facility.
A I'm not privy to those -- to that information.
Q Okay. Is there -- we talked about limiting the quantity of wastewater that one industrial user may be able to send to you, and that is we can take it, but we

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can't take 100 percent of it. Does the size of the sewer pipes also limit the stream that you can take from an industrial user?

A In most cases, no.

Q But could it?

A It could. It depends on where they're at.

Q Do you know how much energy the POTW uses in processing wastewater?

A Well, I can give you an estimated cost of electricity, which is anywhere from 40 to $50,000 a month.

Q Forty to $50,000 for electricity?

A Yes, sir.

Q Is that part or perhaps a good part of the reason that you breakeven on each industrial user?

A No, sir. We're not in it to make money on the industrial users.

Q Okay.

A It's to treat the -- what they discharge to us.

Q So do you set your costs purposefully so that you'll break even? That is, do you charge the industrial user a fixed amount of money -- money fixed on the goal of breaking even on each industrial user?

A To treat their waste, yes.

Q Okay.

1333

A The cost of treating the waste.

Q And I understand from your prefiled testimony at least currently you're taking the sludge that the POTW generates, you're taking that to a landfill?

A Yes, sir.

Q Of course in this case we've been talking about deep well injection of wastewater streams and with you we're talking about sending wastewater streams to a POTW. Are you aware of other disposal options -- we'll stick with the City of Conroe area that's within your CCN -- are you aware of other disposal options for industrial wastewater within that area?

A No, sir, I'm not.

Q Are you aware of any incineration of industrial wastewater within the Conroe area?

A No, sir.

Q Are you familiar with wastewater incineration?

A I've read a lot of articles on it, yes.

Q How much of your -- of the POTW's capacity should you keep in reserve, as not to use, give yourself some cushion, if you will?

A We look at -- we have numbers that -- excuse me. We have numbers as far as capacity that trigger things that we do. But other than to keep at capacity, no, we don't. We don't have a cushion.

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Q One moment.

How would -- if I were an industrial user using your POTW and I wanted to send a waste stream that was high in salts, salt content, the first question is would you accept that wastestream from me?

A Just depends on what they are.

Q Okay. And why is that? Why did you give that answer?

A Well, because we have a treatability inside the plant. We don't treat saline water or salt, per se. It's basically a pass-through.

Q Okay. And when you say pass-through, for the benefit of the judges and anybody else, can you tell us what pass-through means?

A Pass-through is where -- is a pollutant that comes into the plant and goes out the plant at the -- basically the same rate.

Q So high saline waters would simply pass-through the plant?

A Well, and be diluted somewhat with the other water.

Q Okay. Would the salinity of the waste stream have any negative affect on the biological stream process that the POTW employs?

A Only if it's considered over 10,000 milligrams

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per liter, which is hazardous.

Q And the -- just so I'm clear on this, the priority pollutant, that big list that we looked at in Exhibit 6 on Page 17 --

A Yes, sir.

Q -- now, if I am an industrial user of the POTW and I have in place a pretreatment program, does my pretreatment program, does it need to remove all of those priority pollutants?

A No, sir. We have local limits and limits that make a determination. Some of these that are listed, then I do- further investigation.

Q Okay.

A -- if they are other than the local limits that we do have.

Q And is it also the case then -- so I can send some amount of these priority pollutants to the POTW? Correct?

A Yes, sir.

Q And it's also the case that the POTW can discharge some amount of these priority pollutants?

A Yes, sir.

Q Did you -- you just got here today as far as for the hearing. Correct?

A Yes, sir.

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Q So do you know Dr. Pearce, who testified in this case?
A Yes, sir.
Q Okay. And were you here for his testimony?
A No, sir.
Q Okay. And do you -- does the POTW work with Dr. Pearce?
A We've had occasion to use him if we have something that we need tested or -- especially on the water side.
Q Okay. Do you know -- in your experience with the plant, has Dr. Pearce been out to the POTW?
A He came out and took a tour of it.
Q Is that recently?
A Yeah, within the last couple of months.
Q Okay.
A I was not there.
MR. MOORE: Okay. If I could just have a minute, Your Honors, I think I can save us a few on the other end.
Q (BY MR. MOORE) Your prefiled testimony -- I do have a question specific to the prefiled testimony. Could you turn to Page 17 of what is labeled AP Remand Exhibit 5.
A What page again?

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Q Seventeen.
A Yes, sir.
Q Okay. And I am going to direct your attention down to the question -- questioning and answer that begins on Line 15, so the Q and A that begins on Line 15. There you're asked if it would be fair to say that a pretreatment process would often be part and parcel component -- be a part and parcel component of an industrial process that produces a waste stream. Do you see that question?
A Yes, sir.
Q And you answered for about 99 percent of them it is part of their process. My question is, in the context of your answer, who is them?
A The ones that -- the 1 percent.
Q Okay. I still don't follow. You're asked about an industrial process that produces a waste stream. Let me get straight to my question. My question is when you say 99 percent, are you referring to 99 percent of the industries in the entire world that produce a waste stream or are you referring to 99 percent of the industrial users that use your POTW?
A That use my POTW.
Q Okay. And then somewhat of the same question, on Line 19 you're asked if a pretreatment program --

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pretreatment process for an industrial user is a standard part of their process, and your answer is yes, sir. Does your answer here again refer only to those industrial users that are using the City of Conroe's POTW?
A That's all that I can agree to.
MR. MOORE: Okay. I have no further questions.
MS. GOSS: No questions, Your Honors.
JUDGE WALSTON: I want to ask just a couple of clarifying questions, if I can.
WITNESS SOLOMON: Yes, sir.

CLARIFYING EXAMINATION

BY JUDGE WALSTON:
Q You said these industrial users are connected to the facility by sewer lines?
A Yes, sir.
Q Are these sewer lines specially dedicated just for this purpose or do they just pretreat it and put it in their regular sewer line I would call it?
A Into a regular sewer line.
Q And then once it gets to the treatment plant, it's just treated along with all the other sewer?
A Yes, sir.
Q There's no specially-dedicated portion to treat

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industrial waste?
A No, sir.
JUDGE WALSTON: Thank you.
JUDGE EGAN: Mr. Walker?
MR. WALKER: I'll try and be very quick, Your Honor.

REDIRECT EXAMINATION

BY MR. WALKER:
Q Mr. Solomon, you've indicated that the pretreatment at the user you test at least once a year. Is that right?
A Yes, sir.
Q That might suggest that there's no process for determining, I suppose, the waste stream when it gets to the plant and while it's being processed. What do you do daily with that waste stream to ensure that it's appropriate and something that you can effectively treat?
A The industries have parameters they have to test for on a basis there. So we just assume that everything is good unless our plane goes belly up.
Q Okay. What do you do daily at the plant? Can you explain to the Judges just briefly the daily process for testing and processing your stream once it reaches the plant?

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A I'm not quite sure I follow.
Q Okay. What's your daily process for handling the waste stream?
A Okay. As the wastewater comes into the treatment facility and we have a bar screen basically set up. It's a long deal that is a screen that catches the large amount of debris that comes into the plant and takes it out and we take it to the landfill.
Then it goes into an aerated grit chamber that drops out any solids -- or a large percentage of the solids. They're basically grit out of it, and then it goes into an aeration basin that is where it meets bacteria -- biological bacteria that start breaking down most of the organic particles there.
Q Okay. Is that process monitored daily?
A Yes, sir. We have operators there 365 days a year.
Q All right. What happens if a waste stream is introduced to your plant that's inappropriate? Or has that happened.
A Very few times has it happened. It's only basically happened once.
Q In what period of time that you've been operating there?
A The last 19 years.

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Q All right. Have you had an improper discharge into the San Jacinto River during your time there at the plant?
A Not an improper; we've had some violations.
Q All right. What do you do in that situation?
A We have to send a report to the state -- TCEQ, and also do some more testing.
Q And when you say "a violation," what are you talking about?
A We have set parameters that are listed in the permit, and if we exceed those that's considered a violation.
MR. WALKER: All right. Could I have just a moment, Your Honor?
JUDGE EGAN: Yes.
MR. WALKER: Your Honor, I'll pass the witness.
MR. HILL: No questions, Your Honor.
JUDGE EGAN: Mr. Forsberg?
MR. FORSBERG: Very briefly, Your Honor.
RECROSS-EXAMINATION
BY MR. FORSBERG:
Q I don't know if I want to know this, but how many sewer connections are there in your service area?
A I think the last count that I heard was about

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12,000.
Q Would you agree with me that you don't have to dig 5,000 feet below the ground to dispose of Class 1 Waste at your facility?
A No, sir, you do not.
Q Okay. Is there a massive infrastructure of sewer pipes already in place to carry the effluent that your facility accepts --
MR. MOORE: I'm going to object because that's outside of the redirect. It is within the scope of my cross, but it's outside the scope of the redirect.
MR. FORSBERG: It's actually in relation to Judge Walston's question with regards to the type of sewer pipes.
JUDGE EGAN: I'm going to allow it. Go ahead. Overruled.
Q (BY MR. FORSBERG) Do you recall the question?
A No, sir.
Q That makes two of us.
MR. FORSBERG: Can you read that question back?
(Question read as requested)
Q (BY MR. FORSBERG) Is there a massive infrastructure of sewer pipes already in place that accepts the waste streams that the POTW currently

1343

accepts?
A Yes, sir, there is.
MR. FORSBERG: Pass the witness. Thank you.
JUDGE EGAN: Mr. Humphrey?
MR. HUMPHREY: No questions, Your Honor.
MR. MOORE: Just a few, Your Honor.
RECROSS-EXAMINATION
BY MR. MOORE:
Q Mr. Solomon, just a few questions, and I'll stick to that.
Mr. Walker asked you about the monitoring -- the daily monitoring of what we were talking about as in-process wastewaters, but as wastewaters that have entered the POTW but have yet to be discharged.
A Yes, sir.
Q And you answered that question, I believe -- I'm going to have to paraphrase here -- that you have an operator on-site 365 days a week. Is that correct?
A Yes, sir.
Q As to the monitoring of parameters constituents in the in-process wastewaters, I believe that we established in our Q and A that you do not monitor those daily. Is that correct?

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A Now, we --
Q Let me just step back. I believe that we established that on a daily basis, as it concerns the effluent, you monitor for the parameters that are on Page 2 of your permit. Correct.
A Yes, sir.
Q As it concerns the wastewaters when the are still in the facility before they go out the pipe and are discharged to the San Jacinto River, you don't do any daily monitoring there, do you?
A We have what we call process control, which we do a sedible (phonetic) test in DOs -- take DOs and BHs throughout the plant, yes.
Q So any parameters other than those that are on Page 2 of your permit?
A No, sir.
Q Okay. You discussed with Mr. Walker a little bit about the violations of the permitted limits that the POTW may have incurred in the past.
A Yes, sir.
Q About how many of those have you had?
A In my tenure, maybe six. Those came during the hurricane.
Q And you discussed with Mr. Forsberg and Judge Walston sewer pipes. Correct?

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A Yes, sir.
Q Ever had any leaking sewer pipes?
A There's no such thing as a not-leaking sewer pipe.
(Laughter)
MR. FORSBERG: Thank you. That's all the questions I have of this witness.
JUDGE EGAN: Ms. Goss?
MS. GOSS: No questions.
JUDGE EGAN: Mr. Walker?
MR. WALKER: I have no further questions.
JUDGE EGAN: You're excused. Thank you very much.
(Witness Wilder sworn)
MS. FORLANO: May I proceed?
JUDGE EGAN: Yes, you may.
MS. FORLANO: This is Aligned Protestants' witness Dr. Bill Wilder.
JUDGE EGAN: You'll need to speak up, though.
MS. FORLANO: This is Aligned Protestants' witness Dr. Bill Wilder.
JUDGE EGAN: I believe he's been sworn in.
MS. FORLANO: Yes. I wanted to do that before he did.

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WILLIAM R. WILDER,
having been first duly sworn, testified as follows:
DIRECT EXAMINATION
BY MS. FORLANO:
Q Would you please state your name.
A William Ray Wilder.
Q And in front of you you'll find a compilation of documents. I think it may have just been folded up. It's got on the front Aligned Protestants Prefiled Direct Case.
A Okay.
Q Thank you. Would you please find Exhibit 10.
A Okay.
Q What is this exhibit?
A This is my prefiled testimony on behalf of the Aligned Protestants in this case.
Q I think you're going to have to move your microphone closer to you so everybody can hear you.
A That doesn't happen very often.
(Laughter)
A Okay. Is that better?
Q (BY MS. FORLANO) Yes.
A All right.
Q Is this the prefiled testimony that you compiled at part of your participation today?

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A Yes.
Q And do you have any corrections to make to it today?
A No.
Q Do you recognize Exhibit 11?
A Yes.
Q What is this?
A This is a CV or my resume.
Q Did you prepare this exhibit?
A Yes.
Q And is the information on Exhibit 11 true and correct?
A Yes.
Q Does it accurately describe your education, experience and training?
A Yes.
Q Do you adopt these exhibits today as your testimony as if you are giving it live before the Judges?
A Yes.
MS. FORLANO: Your Honor, at this time the Aligned Protestants offer Exhibits 10 and 11.
JUDGE EGAN: Aligned Protestants Exhibits 10 and 11 are admitted.
(Exhibit AP Nos. 10 and 11 admitted)

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MS. FORLANO: And with that we pass the witness.

MR. HILL: No questions.

JUDGE EGAN: Mr. Forsberg?

MR. FORSBERG: I do have a few questions, Your Honors.

JUDGE EGAN: Go ahead.

CROSS-EXAMINATION

BY MR. FORSBERG:

Q Good afternoon, Mr. Wilder.

A Good afternoon.

Q In your testimony, your prefiled testimony, you discuss quite a bit about Huntsman Corporation and Chevron. Is that correct?

A Yes.

Q And you mention that -- and correct me if I'm wrong -- that these are the two largest producers of Class 1 material that you've located in Montgomery County. Is that fair?

A Yes.

Q Have you calculated any actual outputs for either of those companies in terms of Class 1 material?

A I looked at the TCEQ waste manifest summary reports that were given to me for review.

Q Have you looked at anything else in regards to

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calculating the Class 1 material that Huntsman or Chevron Phillips may be disposing of in regards to Class 1 material?

A No.

Q Do you have an idea in an actual number how much Class 1 material as you sit here today that Huntsman disposes on, say, a monthly or yearly basis?

A On the yearly basis for the years that I looked at, which would be '07 and '08, they produced roughly 223 million pounds in '07 and, I think, 227 million pounds in '08, according to the TCEQ manifest.

Q Okay. So if someone were to testify that Huntsman was able to -- well, not able to but actually was disposing of in excess of billions of pound of waste, would you disagree with that?

A Yes, I would disagree with that.

Q Just so I'm clear, what are the titles of the documents that you looked at that showed that 223 million and 227 million are the actual numbers of Class 1 material that Huntsman disposed of?

A These were the waste manifests that were produced by -- I guess -- I believe ERM, based on their review of TCEQ documents. So these were verified TCEQ documents.

Q Now, you represent -- or in your line of work

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you have several clients that are Class 1 generators. Is that fair?

A Yes.

Q And you discuss in your testimony some of the factors in regards to whether you make -- what you advise clients to consider when deciding how to dispose of their waste. Is that fair?

A Yes.

Q Now, is one of the factors that one considers in the disposal of waste public relations or community relations?

A Certainly.

Q Are you a resident of Montgomery County?

A Yes.

Q Are you familiar with Huntsman's presence within the county?

A To the extent that they're there in a couple of different forms, yes.

Q And what forms does Huntsman have within the county that you know of?

A Well, they've got the Conroe manufacturing facility, and they've also got an advanced research center down in the Woodlands, which are still inside Montgomery County.

Q Do you know if they have any corporate offices

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in the Woodlands?

A I believe they have some, yes. If I'm not mistaken it might even be American headquarters, but I know they have a larger presence in Utah as well.

Q Do you believe that -- how the community within Montgomery County and the local community feels about the proposed TexCom facility may play into Huntsman's decision in regards to deciding where to dispose waste?

MR. RILEY: Objection. It calls for wild speculation, not just regular speculation. He's talked about his clients and how he might advise them. There's no -- unless it's been established otherwise -- he has no relationship with Huntsman that I've heard about.

MR. FORSBERG: I mean, Huntsman --

JUDGE EGAN: I sustain the objection. You can lay a better foundation.

Q (BY MR. FORSBERG) In your line of work, if you had a client such as Huntsman that wanted to dispose of Class 1 material and their option was the proposed TexCom facility or to take it out of the county, would you recommend to that client that one factor to consider is how the community would perceive your decision?

A Yes, I would recommend that as something to consider.

Q And what other types of things would you

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recommend they consider?
A The risk management process that's in-house at Huntsman is not something that I'm familiar with, but I have certainly worked with various risk management teams at other large firms, some larger, some smaller than Huntsman. The things you look at in terms of long-range liability are all related more or less to the cradle-to-grave concept for waste management. When you send something out your doors that you've produced as a waste, it doesn't matter where it goes, it's always potentially going to come home to roost as something that you're ultimately responsible for. That's pretty much written into the code here.
So the reality of it is if your waste is disposed of in a larger facility that receives waste from other major facilities as well, other major generators, you, in a sense, have gotten some balance on your liability. Because if that facility ever defaults and goes into superfund, for instance, then you would have other major corporate entities who would be sharing some of your risk. That's one of the major factors usually brought up in consultations of this nature.
Q Are there any other factors that you haven't already mentioned?
A Unfortunately, of course, I'm now 13 years in

1353

this company, so it's a little easier for me to say this, but the new-kid-on-the-block stigma is also something that you always have to try to get around. You don't have a performance record until you start performing. So it's -- again it's potentially a bit unfair, but it's a reality. If you've never operated a facility like this before or this particular facility, for instance, has never operated before, then there are uncertainties that don't exist for facilities that have already been in operation and, as said before, that are sharing contributions from other major generators.
Q Have you ever heard of TexCom prior to your involvement in this case?
A No, I have not.
Q So no client of yours has ever mentioned a company by the name of TexCom as being a -- having a great reputation for waste disposal?
A No.
Q Based on your testimony, would you agree with me that Montgomery County industry is a smaller producer of Class 1 waste than Harris County?
A Yes, I agree with that.
Q And I believe you already testified -- or it's in your prefiled testimony -- that Chevron Phillips and -- which is one company -- and Huntsman produce a

1354

large amount of the Class 1 material in Montgomery County.
A Yes, I believe Huntsman is responsible for 98 or 99 percent by itself.
Q Okay. If Huntsman were to choose not to dispose of its waste at the TexCom facility for whatever reason, do you have any opinion as to whether the TexCom facility could be financially viable absent obtaining waste streams from outside of Montgomery County?
MR. RILEY: Objection. And the base of my objection is I don't know this witness's qualifications to present business related information or profitability numbers. It seems like he's an expert in some environmental matters but not in business matters.
JUDGE EGAN: You want to -- the objection is sustained.
Q (BY MR. FORSBERG) If you were -- have you ever advised a company that wanted to create a Class 1 or Class 2 well?
A No, not a well.
Q What types of advice do companies who procure your services give?
A It's been a lot of years, so that's a pretty broad spectrum, but everything from -- I've worked on Class 1 hazardous waste incineration permits in the

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Houston area. That was back in the '80s, I believe. And I've also worked on many different RCRA facilities where we were looking at waste disposal options, and very likely some of them probably did include on-site wells. I just can't remember specifics right now. But I've looked at incineration.
And then as part of my job while I was a technical director for OHM Corporation, one of my charges was to be a member of the technology assessment and commercialization team where we had to monitor pretty much all the technologies that were being offered worldwide for either remediation or waste disposal to give them a -- you know, evaluate them for their technical feasibility and economic viability.
Q So you have provided advice to companies previously with regards to the economic viability of certain operations?
A Yes.
Q What kind of education do you have in that?
A School of necessity, I suppose. It was, you know, just being part of either projects or cases where future cost calculations came into play. Certainly with some of our clients when they were looking at expanding facilities or building new facilities, we would advice them on what types of processes and costs they could

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anticipate for disposing and managing of the wastes that were going to be part and parcel of the processes they were proposing.

Q If you had a client that was moving to a location where one potential customer could account for an extremely large majority of their proposed, you know, cash flow, so to speak, would you advise that client to contact that potential customer prior to beginning operations?

A I'm of Germanic stock, so I would advise the client to get an ironclad contract, you know, before moving in.

Q Have you seen any sort of agreement, contract, letter or anything suggesting that there's any type of agreement between Huntsman and TexCom?

A I may have seen some correspondence that related to the fact that there wasn't any kind of official tie between TexCom and Huntsman or some other facilities or some other entities, but I don't recall specifics at this point.

Q Do you have an opinion as to whether TexCom is going to need to acquire waste from outside of Montgomery County in order to remain operational?

A Based on my review of the numbers, yes.

MR. RILEY: I'm sorry, can I -- I couldn't

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hear the tail end of Mr. Forsberg's question. Before we move on, could I ask that the reporter read that question and answer back?

JUDGE EGAN: Yes, you may, but I want to remind you if Mr. Moore is doing the cross-exam, he needs to be making the objections.

MR. MOORE: Not this witness.

JUDGE EGAN: Okay. I want to make sure --

MR. RILEY: Yeah. No, no, I'm sorry. We've been -- for the afternoon --

JUDGE EGAN: -- bouncing back and forth. I just wanted to make sure --

MR. MOORE: -- apologize, Judge.

JUDGE EGAN: That's okay.

Can you read the question for him?

(Question read as requested)

MR. RILEY: Thank you.

Q (BY MR. FORSBERG) Can you tell us what that opinion is?

A Well, my review of the numbers indicates that, you know, with the exception of a small percentile, the available material coming from Huntsman would be approximately a 120,000 gallons per day, weekday. This is just Monday through Friday. And based on as little as an eight-hour operational day at 350 gpm at the

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proposed TexCom facility, you're looking at around 160 or a little -- slightly more than 160,000 gallons that can be injected. So right there, even with Huntsman you've still got a 40,000 gallon-a-day differential.

And I don't know anything about TexCom's operating costs or start-up costs, but ideally you'd want to run at least full-bore for an eight-hour period to make as much profit as possible. I do know from some of the other facilities that I am familiar with that it's not a high-margin business.

Q Does Huntsman, to your knowledge, have a potential alternative to dispose of its waste?

A Yes.

Q I believe you testified -- or your prefiled testimony mentioned that Huntsman -- correct me if I'm wrong -- actually has permits to dispose of its own Class 1 waste?

A There were TCEQ records that indicated they had two active permits for deep wells on their property that they have not acted on yet.

(Brief pause)

MR. FORSBERG: I'll apologize about the pause. I'm trying to cut to the chase.

Q (BY MR. FORSBERG) You mention in your prefiled testimony other facilities -- I believe the Conroe POTW,

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a facility in Liberty County and a facility in Jefferson County that all currently accept Class 1 waste. Do you recall that?

A Yes.

Q Have you seen any indication or heard from any of your clients that any of these facilities is improperly or not safely disposing of waste, Class 1 waste?

A No, I haven't come across any information like that.

Q Do you have any reason to believe that any of these facilities will not be able to continue accepting Class 1 waste that's being generated in Montgomery and surrounding counties in the future?

A No.

MR. FORSBERG: Pass the witness. Thank you.

MR. SCENCENBAUGH: No questions, Your Honor.

JUDGE EGAN: Public Interest?

MR. HUMPRHEY: No questions, Your Honor.

JUDGE EGAN: Mr. Riley?

MR. RILEY: Yes, ma'am, just a few.

CROSS-EXAMINATION

BY MR. RILEY:

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Q Dr. Wilder, let me introduce myself first. My name is John Riley. I represent the Applicant in this matter, TexCom Gulf Disposal, LLC. We haven't met before, have we, sir?
A I don't believe so.
Q However, you are 15 days older than me. I noticed that on your CV.
A Let's not rub that in.
JUDGE EGAN: Let's be nice.
(Laughter)
Q I think you've actually weathered the storm a little better than I have, but --
A I don't know about that.
MR. FORSBERG: I would agree with you. I'm sorry, that was --
MR. RILEY: That's okay.
(Laughter)
Q (BY MR. RILEY) I notice another similarity, we have a similar educational background, at least at the undergraduate level. You have degrees in biology and I had a concentration in genetics, so we at least started to some degree from the same point in the '79-80 range. And we both each have found our way to the environmental practice -- in different disciplines, but let's talk about your -- the firm you work for Axis Environmental.

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Is that a firm you own?
A Yes.
Q And I don't want to belabor the point, but in your CV, which is quite lengthy, it appears that you -- some portion of your work is related to testifying as an expert witness. Is that right?
A Yes.
Q And you've given a list of the types of cases you've been involved with, and it's a long list. Could we -- is it chronologically organized?
A No, unfortunately not.
Q Okay.
A To some extent, yes, but then things kind of got moved around and I'm -- when your a one-man-shop the word processing department tends to let you down.
(Laughter)
Q (BY MR. RILEY) Yeah, I've had that experience, too.
All right. Let's talk about a couple of the items Mr. Forsberg asked you about. Mr. Forsberg asked you about whether you had any reason to believe that certain waste disposal facilities had issues with compliance. Is that a fair characterization of the questions he just asked you a moment ago?
A I believe he asked me specifically for three

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facilities if they had any compliance issues that I was aware of and I said, no, I did not.
Q Okay. Which three did you think his question applied to?
A That was the Conroe wastewater treatment plant, the facility in Dayton or Liberty, which escapes me now, the name of it, and the Newpark facility down in Winnie also called Big Hill Industries.
Q And those are -- the last two are they Class 1 injection wells?
A Yes.
Q Have you investigated their compliance history with the Texas Commission on Environmental Quality?
A No.
Q Are you aware that since around 2000 or so each industry that holds a TCEQ authorization of any type is evaluated for compliance history on an annual basis?
A Yes.
Q Did you look at those records for those facilities?
A No, I did not.
Q You mentioned that Huntsman has a Class 1 authorization, and I think you attached to your prefiled testimony some exhibits, and I believe --
MS. FORLANO: No, those were taken out at

1363

the prehearing conference.
MR. RILEY: Really? I'm sorry.
MS. FORLANO: Yeah, because they were disclosures that were accidentally included -- they were just supposed to be sent out and it got included in the binder and we took those out.
MR. RILEY: Then, I'm sorry, but I'll need a minute to organize just a couple of quick questions related to those documents.
(Brief pause)
I think we're up to TexCom 107. Is that correct?
(Discussion off the record)
MR. RILEY: Okay. And while we're on this topic of exhibits, I don't know if I neglected to offer the drawing that's, I believe, 104. If I neglected that earlier, may I offer it now?
JUDGE WALSTON: It's already been admitted.
MR. RILEY: May I approach the witness.
JUDGE EGAN: Yes, you may.
(Exhibit TexCom No. 105 marked)
MR. RILEY: If I may continue, I apologize to the rest of the group. I somehow missed a cue and didn't make copies of this exhibit for everyone.

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MS. FORLANO: May I go up to the witness stand and look over the documents to see exactly what he's looking at?

MR. RILEY: Absolutely as far as --

JUDGE EGAN: Yes.

MS. FORLANO: I don't have any objection.

MR. RILEY: I was going to ask a few predicate questions, but at this point I'd offer it into the record.

JUDGE EGAN: Any objections from anyone else?

(No audible response)

JUDGE EGAN: Then TexCom Exhibit 105 is admitted.

(Exhibit TexCom No. 105 admitted)

Q (BY MR. RILEY) Doctor, would you take a look at the Exhibit now labeled TexCom Exhibit 5?

A Okay.

Q Have you seen it before?

A Yes.

Q These are some documents that you apparently reviewed in preparation for your testimony in this case. Is that true?

A Yes.

Q Somewhere in that -- well, let's be clear. How

1365

many pages are in TexCom Exhibit 105?

A Appears to be six.

JUDGE EGAN: How much?

WITNESS WILDER: Six.

Q (BY MR. RILEY) Am I correct that you drew that information -- or retrieved that information from the TCEQ web site?

A Yes.

Q And it seems to be a printout of some information available from the TCEQ. Is that right?

A Yes.

Q You mentioned, when Mr. Forsberg was asking you some questions about Huntsman -- well, just to be clear -- the facility referred to in the -- in that document is the Huntsman plant on Jefferson Chemical Road. Is that correct?

A Yes.

Q And it appears to be some listing based on its identifying number of -- at least some of its authorizations issued by the TCEQ. Is that right?

A That's correct.

Q In that set of documents there is a reference to Class 1 UIC permits. Did you find that?

A Yes.

Q And I think, if I'm not mistaken, there's a --

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toward the end of the document there's an indication of where at least one of the two Class 1 wells is located in terms of geologic strata. Do you see that?

A Yes.

Q Do you see it says Jackson/Yegua?

A Yes.

Q I'm going to assume that you don't have knowledge of the geology in the region we're discussing. Is that correct?

A That's correct.

Q So you couldn't tell me whether the Yegua is the Cockfield Formation or synonymous with Cockfield Formation?

A No, I couldn't.

Q Doctor, what percentage of your time would you say you spend as a testifying expert in various legal proceedings?

A It varies from year to year. Actually there hasn't been very much of it the last few years. It seems to be kind of cyclical. I had a lot going on in Louisiana until Katrina, and then Rita came along and blew everything to Wisconsin. But there have been years when it's been 80 percent of my work, and then other years where I do a lot of litigation support that doesn't go to the witness level.

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Q I think you might have an uptick in your business along the Gulf Coast in the near future, but that's speculation on my part.

And I apologize for that comment.

JUDGE EGAN: That's all right. Go ahead. I wasn't sure what you were referring to, but proceed.

Q (BY MR. RILEY) All right. A lot of your testimony is somewhat of a rebuttal to some of the testimony offered by Mr. Bost. Is that correct?

A Yes.

Q And you looked at some of the information that Mr. Bost accumulated, and you disagree with some of his calculations and assumptions of the need for a Class 1 UIC injection well in Montgomery County. Is that correct?

A Yes.

Q And Mr. Bost was here earlier in the week, and I don't think I saw you here. Am I correct that you were not present for Mr. Bost's testimony?

A No, I was not.

Q And I apologize in advance for asking these questions -- quickly though, are you being compensated for appearing here today?

A Yes.

Q And do you have a -- how much time have you

1368

spent in number of hours in preparing for -- preparing your prefiled testimony and preparing for testifying here today?

A I haven't looked at that.

Q Have you invoiced the county --

A Yes.

Q -- at this point?

A Yes.

Q And if you recall, how much have you invoiced the county?

A I honestly don't know at this point. It's been a -- a crazy few months.

Q That's okay. I'll move on.

You said that it was incorrect -- or would be incorrect if someone were to say that -- I believe it was in reference to Huntsman -- that they disposed of billions of pounds of waste. That would be incorrect?

A Based on my review of the available records, yes.

Q And did you understand that limitation or that description to be an annual number?

A Yes.

Q Okay. If it were just a general reference that Huntsman disposes of billions of pounds of waste, that would be correct. Right?

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A I don't know that I could answer that. It's a pretty broad --

Q Well, I thought -- I'm sorry. I thought you said that on an annual basis the numbers were 223 million pounds.

A For 2007, yes, roughly.

Q So if you took that and just multiplied it by four years, that would be a billion. Correct?

A Oh, if you weren't limiting it to -- oh, yes. Yes, I'm with you now.

Q So unless the limitation was placed on an annual basis, the billions of pounds of waste disposed of by Huntsman would be true. Correct?

A Given an unlimited number of years, yes.

Q You mentioned a concept which I think most of us -- probably resonate with most of us of cradle-to-grave. Is that correct?

A Yes.

Q And in that -- in the context of our discussion, you're talking about a generator of a waste is responsible for that waste until it's finally and permanently disposed of. Is that right?

A One would think, but the government has a way to come back no matter what.

Q They certainly do, and I'm sure you've done

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some superfund work. Is that correct?

A Yes, I have.

Q And the notion in superfund context is that generators of waste are jointly and severally liable if there's a future problem regarding disposal or contamination resulting from that waste. Is that the idea?

A Yes.

Q So when you talked earlier about there being some comfort in a group of companies, that's because there's a notion of contribution from other companies. If one -- joint and several means that any individual company could be held responsible for the whole mess, so to speak. Is that right?

A Yes.

Q And so -- but the comfort then comes from they can seek contribution in terms of remediation costs or some other monetary recovery from other users of the same facility. Is that right?

A That's correct.

Q Do you know what an orphan share is in the context of a superfund case?

A Well, I believe it's the same as a de minimis contributor, de minimis party.

Q Well, could it also be a share that -- where

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the company is no longer in existence? In other words, there's a proportionate share of the liability that may not be recoverable from a company?

A Yes.

Q But if you're correct that there is comfort in number, then a commercial disposal facility would be preferable from that point of view than an individual disposal facility. Would you agree?

A You mean one owned by the generator?

Q Yes, sir.

A Yes, although it -- if I may, it cuts both ways. One you have complex management over the facility, so you don't have to worry about somebody outside of your circle of influence doing something with the facility that you don't agree with. But, yeah, in general, you're alone on the hook if it comes to that.

Q So far as we know, Huntsman has not taken advantage of its UIC permits that you identified for Mr. Forsberg and me in the documents, and they are disposing of their waste off-site. Is that correct?

A Yes.

Q Is it reasonable to say that a factor might be this joint and several liability concept that you've described as a motivator for some of your clients?

A It certainly could be, yes.

1372

Q I see that you were with Golder Associates for some time during your career. Is that right?
A Yes.
Q And as part of that -- what were your responsibilities with Golder?
A I was the branch manager for the environmental office in Houston. And one of the reasons I suppose it was only two years there was I never quite got the idea of what they wanted me to do there.
(Laughter)
I managed the office. I was supposed to help with business development and keep myself quite billable on top of it. So it was a contained Canadian scheme that evaded me.
Q (BY MR. RILEY) A Canadian management scheme?
A Yeah, Golder is a Canadian company.
Q Okay. I've worked with Golder on some landfill matters and that's where I was headed.
A Their landfill office in Houston -- the Houston staff is a really good bunch of guys. Golder, I think, has a tremendous capability in geotechnical engineering and landfills.
Q And the reason I bring that up is I'm trying to get a sense of the various waste disposal options in the context of our discussion. So could you list them for

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us? What are the waste disposal options as you see it in -- for Class 1 non-hazardous waste in the area of Montgomery County?
A Class 1 liquid non-hazardous --
Q Yes, sir.
A There's the landfill option, which, of course, would involve solidification, so it's a -- it's a very dubious option. There's the transportation to deep wells at this point outside of the county. There would be processing of the material on-site through a facility -- through a wastewater treatment facility permitted under TPDES. Or there would be potentially pretreating it to the satisfaction of the Conroe wastewater treatment works.
And I guess if you had a real wacky bent, you could send it to a Class 1 hazardous facility.
Q Why would that be a wacky bent, sir?
A Because it's a good way to spend money you don't have to.
Q I didn't notice on your list a possibility of incineration?
A That would be the Class 1 haz facility I was referring to. I don't think there are too many operations that I'm familiar with -- at least in this part of Texas -- that routinely burn Class 1 non-haz

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liquids.
JUDGE EGAN: I'm sorry, the last part of that, please?
WITNESS WILDER: Class 1 non-hazardous liquids.
JUDGE EGAN: Thank you.
Q (BY MR. RILEY) It's been suggested that that's a viable option to the TexCom facility in this case. Would you agree with that?
A Viable in terms of technology, yes. Again, viable in terms of economics, I don't think so.
Q And I think you testified clearly that you don't know of any incineration facility that actually incinerates Class 1 non-hazardous waste of the type we're discussing?
A Not to my knowledge, but that's -- that certainly doesn't preclude it from being there.
Q Have you ever advised any client of yours to dispose of its waste -- Class 1 non-hazardous aqueous waste of the type we're discussing through incineration?
A There may have been one or two instances where it was a singular event that created the waste and they were collocated to an incineration facility that could co-burn their material and bring their Btu value down so they could actually get more through-put on the

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incinerator. But that was a highly specialized case.
Q Would you agree with me that it would be a fairly intensive energy -- from an energy perspective -- to incinerate the types of waste we've been discussing?
A Yes.
Q Sorry, my knee hurts.
A Wait 15 days.
(Laughter)
Q (BY MR. RILEY) I told you you were fairing the storm better than I was.
You talked in your prefiled testimony -- this is on -- I think it's Page 9 -- about having expertise in the fate and persistence of man-made materials in the environment.
A Yes.
Q Would you agree with me that much of the "treatment" that occurs -- and I'm putting quotes around the word "treatment" for this question -- that occurs in a POTW is dilution?
A For some of the inorganics, possibly, but the organics are reasonably well degraded and managed.
Q And those are the biological processes. Is that correct?
A Yes.
Q The inorganics would be things like metals and

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various other things that we would not associate with an organic compound. Is that right?
A True.
Q Are the inorganics then mostly passed through a POTW into a receiving water?
A Some of them are going to wind up -- a great deal of them, depending on the location and the type of waste they receive, a great deal of the metals are going to sorb onto the materials that form the sludge. They tend to form complex bonds with either the organic or the clays that also form the sludge. So you can drop out a lot of the metals in your sludge, but there are the dissolved solids and things like that that are recalcitrant too that are going to pass through.
Q And where do they go, the pass-through types of --
A It goes out the effluent discharge into the receiving body.
Q They similarly collect in sediment of the receiving body?
A They can, yes.
Q I grew up on the Hudson River. Are you familiar with the Hudson River at all?
A Yes, I am.
Q Are you familiar with some of the sediment

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problems of the Hudson River resulting from --
A We did a large PCB job there when I was with OHM.
Q And that was, I would guess, General Electric. Is that --
A Yes.
Q But are you aware of the issues that could be created in a water body through sedimentation of minerals or metals over time?
A Yes.
Q Do you know what General Electric has caused to do at this time regarding the remediation of the Hudson River?
MS. FORLANO: Your Honor, I'm going to object.
MR. RILEY: It's regarding the water body receiving waters. I have a few more questions.
JUDGE EGAN: What is your objection?
MS. FORLANO: That's fine.
JUDGE EGAN: Go ahead and proceed.
A I don't know what they're doing right now. We were actually doing bio-remediation experiments at the time with very large, very expensive machines on their behalf.
Q (BY MR. RILEY) I'll leave it then.

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You talk in your prefiled testimony about compatibility of injected wastewater with the subterranean formation.
A Yes.
Q And I -- just to orient you for my questions -- I think it begins somewhere around Page 18.
A Okay.
Q I don't know if you're concerned or you're just elaborating on the notions of compatibility, but is there something that you're aware of that suggests to you that to propose injected fluids in TexCom's application are incompatible with the reservoir where it's proposed to be injected?
A There was a section -- one of the previous testimonies that I reviewed on this case -- that referred to the need to increase the salinity, I believe, of the injectate to a certain level or to maintain it at a certain level to prevent swelling or shrinkage of the clay that was in the formation in which it was to be injected.
Q Any other types of concerns that you're -- that you intend to reference in this -- in the context of your testimony?
A No.
Q Just a few more.

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Doctor, is it your understanding that there's a limitation in waste permitting in the state of Texas that would limit the geographic boundaries to a particular county -- that's a bad question. Let me try again.
There's been a lot of discussion in this case and in your prefiled testimony about the waste disposal needs in Montgomery County. Would you agree with me?
A Yes.
Q And if I understand your testimony, the gist of your testimony is Montgomery County is doing just fine in this context in terms of waste disposal of Class 1 non-hazardous waste. Is that correct?
A Yes.
Q And it's probably because Mr. Bost concentrated on Montgomery County to make some points that you concentrated on Montgomery County. Is that true?
A That's correct.
Q But do you understand that there's no limitation to -- in terms of regulatory limitation -- that stops at the county boundaries for waste disposal?
A Yes.
Q In fact, if I understand your testimony, you make reference to out-of-county waste disposal

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facilities that are currently being utilized by Montgomery County -- I'll call them residents, but at least industries operating in Montgomery County. Is that true?

A Yes.

Q Mr. Forsberg asked you some questions about community support or community unrest, for lack of a better term, as it pertains to advice you might give to a client. Do you think the folks in Liberty County are happy to have Tex -- excuse me, Huntsman's waste coming into Liberty County?

A In that particular area of Jefferson County, which is very close to Chambers County, I think Newpark probably does provide an economic boost. There's not a whole lot else going on in that particular part of the coastal plain right now. So I don't know if they're happy or not. They're certainly working there.

Q And as I mentioned earlier, I've done a fair amount of landfill permitting in my career, and I've found it interesting in that context that communities that surround a landfill facility and some of their thoughts about whether a permit should be granted or not. Have you had any of those experiences?

A Yes.

Q I know of no instance, even though there's been

1381

significant community opposition to some of those permits, where the landfill has suffered from -- in terms of customer base. Are you aware of any?

A I'm not sure I understand the question.

Q Certainly. I think -- I'm not trying to dance around this. There was some notion that it might factor into a company's decision how the community -- as it was described earlier how the community feels about the location of the waste disposal facility. Is that the idea that we were discussing?

A Yes.

Q And I guess I have to say this, I'm not familiar with any landfill application where I found a welcoming community.

A I agree.

Q So there's generally opposition to landfills. Would you agree?

A Yes.

Q We still use them quite a bit. Is that right?

A That's -- yes.

Q So would you expect the same kind of dynamic to apply then if there was some community outrage, so to speak, about the location of the landfill, that you would advise your clients not to use that landfill for disposal?

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A I suppose it's kind of apples and oranges though. I mean, the footprint of a landfill tends to be, you know, what determines the places in which the facility like that can generally be located as opposed to an injection well, which can potentially have a pretty small surface footprint, but, depending on the formation and everything else, a much greater effect underground than just the surfacial footprint.

Q And I hear you, and you're not an expert in geology so I'd really rather not go there unless you would like to. I'm talking about community feeling and that factor in decisionmaking for an industry you might advise.

A I guess I agree. Most neighborhoods don't want a waste treatment facility placed in their neighborhood.

Q There's no survey data that you've referenced in your prefiled data about community feelings as it pertains to the TexCom disposal facility. Is that true?

A That's true.

Q I know of no polling information or anything that might indicate in a more substantial way how the community feels about TexCom. Would you agree with me?

A I'm not aware of any such things, yes.

Q And when we talk about community, it tends in some cases to be about some folks who are vocal about

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opposition. Would you agree that in the context of environmental permitting, that's often what we think of when we think of community?

A Well, by definition those are the people you hear from, yes.

Q And in some situations it may be quite a few people. Would you agree?

A I've seen that, yes.

Q What's the population of Montgomery County as best you know?

A I don't know.

Q Is more than a couple hundred people?

A Yes.

Q Substantially more as far as you know?

A Yes. I believe the Woodlands alone is about 90 or 100,000 people.

Q And if there were even as much as a thousand people who opposed the project, that would still be a small percentage of the population of Montgomery County. Would you agree?

A Yes.

Q Do you know how many -- just as an example -- how many trucks are necessary to convey the waste -- Class 1 non-hazardous waste we've been discussing from the Huntsman facility to a disposal facility on a daily

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basis?
A Are we using my numbers or Mr. Bost's numbers?
Q Whichever ones you like. I assume it's --
A Yes, I do have an idea in both cases.
Q All right. And how many trucks would you say are necessary?
A Using a five-day work week for my calculations for 2008, it would be between 18 and 20 trucks a day from Monday to Friday. And for Mr. Bost's calculations, it would be somewhere between 200 and 205 trucks a day Monday through Friday, 52 weeks a year.
Q Okay. Obviously you don't agree with Mr. Bost's calculations, but --
A No. I've been part of a large of remediation operations where we've run trucks, and when you get up into the 50 or 60-truck-a-day routine, that's a lot of trucks.
Q Is the difference -- do you have a difference in the volume capacity of these trucks or --
A No. The differences in terms of the waste being generated and disposed of.
Q Okay. So we have a number on an annual basis -- at least in 2007 I think you mentioned earlier.
A 2008.
Q 2008?

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A Yes.
Q I'm sorry. 2008, and I think it was 235 million pounds of waste.
A I think 2008 was about -- yeah, it could have been. It was somewhere in that ball park. But there were also some supporting documents that were offered up by Mr. Bost that indicated 75,000 truck loads of -- from Huntsman to Newpark in one year.
Q Okay. And that's what I'm trying to get to just quickly. I really have a very simple point to make eventually.
A Okay.
Q But just in terms of getting the number of trucks right, how did Mr. Bost perform his calculation?
A I don't know for a fact. I think he took his volume estimate or his -- what he claimed to be the volume generated, and converted it from pounds to gallons with an 8.34 conversion factor, and then presumably -- or looking at it, I believe he applied a 6000-gallon-per-truck load limit, which is approximately right for a tanker truck, which is what I did.
Q Okay. So where did he go wrong then in calculating his numbers?
A I believe he had a quantity generated that was 20 times in excess of what the records -- that the TCEQ

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records showed.
Q Did he -- I mean, I'm -- it may seem as though I have a point here, but I'm really just trying to understand. We have a volume on an annual basis.
A Yes.
Q All right. In terms of -- in pounds. Correct?
A Looking at the record, sometimes it's pounds, sometimes it's tons, sometimes it's gallons.
Q Okay. Did you convert a number to gallons or did you convert information --
A I did everything to pounds, and then from pounds to gallons.
Q Okay. And what number did you come up with when you did that conversion?
A For 2008 I think it was in the vicinity of 227 or 235, whatever the exact number of pounds generated by Huntsman delivered to Newpark was in 2008. That worked out to approximately 4500 or 4530 truckloads a year. And using a 52 week year, five days a week, that came out to approximately 18 to 20 trucks a day.
Q What conversion did you -- what factor did you use to convert from pounds to gallons?
A 8.34. That's what Mr. Bost had in his testimony.
Q You think it was just a math error on his part?

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It sounds like he did the same thing, but --
A I'm not sure. It appears to be a tabulation error. The supporting documents -- the TCEQ waste manifests clearly show numbers that are 20 times less than what Mr. Bost claims was generated.
Q Okay. Do you know how many trucks are anticipated to be visiting TexCom facility if it's -- if its permit is issued and it is actually in operation on a daily basis?
A No, because I didn't see anywhere where they showed clearly what type of operational schedule they were going to have. In other words, how many gallons they were going to inject a day, which would dictate how many trucks a day they needed.
Q Okay. And did you review the full application, sir?
I should say -- I should put a plural on that. Did you review all of the applications that are the subject of this proceeding?
A I don't know. I reviewed quite a bit of documentation, but I didn't spend as much time on parts of it as others. So I might have glanced at most of it, but I tended to concentrate on the aspects of it that were germane to my review.
Q Okay. And you know that there's a surface

1388

facility application that's also being considered in this proceeding?
A Yes.
Q Did you review that?
A I looked at some of the diagrams in that, yes.
Q Did you review it -- the text or did it help you in any way in reaching an approximate number of trucks that might visit the TexCom facility?
A Well, the only way I would have to know how many trucks would visit, again, was the 350-gallon-per-minute maximum injection rate, and I believe at one point there was talk of running the facility 24 hours a day. Given my background in operations, it would be wonderful if you had a facility that you could run 24/7, but they're very few and far between.
So realistically if you're looking at even a 75 percent up time, or 66 percent, then you're looking at 16 hours a day, which would be approximately 320,000 gallons a day. So divide that by 6,000, you come up with roughly, what, 50, 60, trucks?
Q Did you just do that in your head, sir?
A I don't know --
Q -- that's what I'm --
A Didn't you see my eyes doing this? Yes.

1389

(Laughter)
Q (BY MR. RILEY) I am intrigued by your answer on the -- with your skill set and operational knowledge that you think it's optimistic to expect a facility to be operational 75 percent of the time. Did I understand your testimony --
A Yes.
Q And that's just through the -- I assume things happen. Is that the "things happen doctrine"?
A Yes. Let's say "things" happen.
Q Yeah, that's what I was going to say.
MR. RILEY: This will take a second. I'm sorry. It's good use of our next two minutes, I believe. Could Mr. Moore approach the witness and provide him with a document?
JUDGE EGAN: Yes.
(Exhibit TexCom No. 106 marked)
JUDGE EGAN: While you're doing that, I'm going step out just a moment.
(Brief pause)
JUDGE WALSTON: You can go ahead and proceed.
MR. RILEY: That's okay? I didn't want to...
Q (BY MR. RILEY) Dr. Wilder, have you had a

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chance to look at what's now been identified for the record as TexCom Exhibit 106?
A I'm looking at it right now. This is the first time I've seen it.
MR. RILEY: While the doctor is reviewing this, Judge, this is a certified record of the TCEQ and so I'd offer it into the record as TexCom Exhibit 106.
JUDGE WALSTON: Any objection?
MS. MENDOZA: I'm just going to have -- I can't read the certification.
MR. SENCENBAUGH: The copy we have doesn't appear to have a complete certification on it. It looks like a copy, but it's hard to see exactly what's on there.
JUDGE WALSTON: I can't hear you.
MR. SENCENBAUGH: Our copy, Your Honor, I can see a date, but I can't see the certification stamp on it.
JUDGE WALSTON: Do you have an objection to it for not being authenticated? Is that --
MS. MENDOZA: Do we have a better --
MR. RILEY: -- I don't. I can show you the original. It just doesn't copy well when it's through a machine.
JUDGE WALSTON: Anyone else?

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MS. FORLANO: Can we just put the original as the record -- in the record.
MR. RILEY: I guess we could if that's insisted upon. I'd rather not give up my original -- shy of completing our proceeding. I'll do what you ask me to do. I think it's -- it's just a matter of copying. With you put it in a copier you can't get the blue ink to show up very well.
JUDGE WALSTON: If there's no question about the authenticity, we can keep the copy.
MS. FORLANO: There's not.
JUDGE WALSTON: I do have one question on mine. It's like the eighth page is blank.
MR. RILEY: Let me see if that's another problem.
Apparently it's just a separation page between two permits.
JUDGE WALSTON: All right. Then TexCom Exhibit 106 is admitted.
(Exhibit TexCom No. 106 admitted)
Q (BY MR. RILEY) Dr. Wilder, just a few questions. Do you see in the exhibit on the first page, sort of in the upper right-hand corner it refers to Permit No. WDW383?
A Yes.

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Q And then the permittee is Huntsman Petrochemical Corporation, 541 Jefferson Chemical Road, Conroe, Texas. Is that correct?
A Yes.
Q And does it appear to be the authorization that is referenced in the earlier exhibit that you relied upon -- or you reviewed, for WDW383?
A Yes, it is.
Q Would you turn from the first page -- I'm sorry, let's finish out. There's also a permit for WDW384 further back in the document. Is that correct?
A Yes.
Q And then there's a separation page and then it appears to be an envelope -- or copy of an envelope of some sort. Does that look right to you, the last page?
A No, I don't have that.
Q I'm sorry. Apparently the exhibit copy doesn't have the envelope.
So it looks like the permits Huntsman holds for WDW383 and 384. Is that correct?
A Yes.
Q They're certified records of the agency. Would you turn now then to Page No. 2 in that document, first document, WDW383?
A Yes.

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Q Do you see where, under Roman Numeral IV, giving a general description and location of the injection activity, the last sentence in that paragraph says, "The injection zone is within the Jackson and Yegua formations at the approximate subsurface depths of 4996 to 6589. The authorized injection interval is the Yegua (Lower Cockfield) Formation at the approximate subsurface depths of 6106 to 6589 feet." Did I read that correctly?
A Yes.
Q Doctor, there's a point in time when you struck out on your own. Right? I mean, formed your own business?
A Yes.
Q And is it fairly safe to say you were the new kid on the block at that time?
A Yes.
Q So you made a run at it. Over the last 13 years or so you've been successful in establishing your business. Is that right?
A That's correct.
Q So this kid on the block phenomena, that would be true of any new business. Is that right? You mentioned that in cross-examination --
A Yes, everybody has got the threshold to overcome.
Q And in your experience, have there been new company waste disposal operations that have overcome the new kid on the block phenomena and been successful?
A Yes.
MR. RILEY: Thank you. I have no further questions.
JUDGE EGAN: Ms. Goss?
MS. GOSS: No questions, Your Honor.
MS. FORLANO: I do have some questions, but I see the hour. And so I'm looking for guidance from Your Honors.
JUDGE WALSTON: Do you know how long you'll be or --
MS. FORLANO: Less than an hour. I mean, I don't even think I'll get that far, 30 minutes, maybe 45.
JUDGE WALSTON: Is the witness available tomorrow or is that a problem?
WITNESS WILDER: I could try to get back up here. I've been told I need to go see a doctor tomorrow.
JUDGE WALSTON: Okay.
WITNESS WILDER: So wait 15 days.
JUDGE WALSTON: Why don't you go ahead and

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proceed.
MS. FORLANO: Thank you, Your Honor.
REDIRECT EXAMINATION
BY MS. FORLANO:
Q Dr. Wilder, earlier this week -- or maybe it was last week -- we had some testimony regarding TexCom applying for a fall-off test. And there's been some testimony that TexCom did not comply with all of the parameters in that fall-off test. Do you understand that?
A Yes.
MR. RILEY: I'm going to limit my objection just to that's counsel's characterization of the testimony, but I'm -- I just want to be clear on the record that I'm not necessarily agreeing with that characterization.
JUDGE WALSTON: That's fine. Your objection is noted.
Q (BY MS. FORLANO) Well, in advising clients you talked earlier about that -- you know, this new kid on the block theory that you want a client -- you want a disposal facility that has a track record. If you in advising a client had heard that a new applicant for a disposal facility had received a permit for something like a fall-off test and had failed to comply with it,

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would you continue to recommend to a client or even start to recommend to a client that they should go ahead and go with that disposer?

A It would probably send up a cautionary flag to look into the engineering more carefully and make sure that they -- the plan calls for a stricter interpretation or adherence to the guidance.

Q Okay. Would you please -- in that stack of binders up there, I know there's a TexCom prefiled testimony volume -- I believe it's 7 of 7.

A Okay.

Q Can you turn to Exhibit 92?

A All right.

Q What is that?

A This is the prefiled testimony of Richard C. Bost, P.E., (Tx), P.G. (Texas) CCGWP (Int'l) on behalf of Applicant TexCom Gulf Disposal, LLC.

Q So this is the prefiled testimony that you reviewed from Mr. Bost?

A Yes.

Q Could you turn to Page 16, please?

A Okay.

Q Could you read to us Lines 1 through 5?

A QUESTION: "How much Class 1 non-hazardous liquid waste is generated annually in Montgomery

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County?"

ANSWER: "In 2007 approximately 4.7 billion pounds of Class 1 non-hazardous liquid waste were generated in Montgomery County based on corrected TCEQ records and excluding surface water discharges through publicly-owned treatment works (POTWs)."

Assuming average density of --

Q I'm sorry, just to Line 5. Thank you.

So when you reviewed Mr. Bost's prefiled testimony, you understood that he meant 4.7 billion pounds annually, or at least in 2007. Is that correct?

A Yes, exclusive of what went through POTWs.

Q So it wasn't a general 4.7 billion pounds over a few years. It was actually for one year?

A Yes.

MS. FORLANO: Your Honor, I have a rather large exhibit to distribute. So if you would just give us minute to do that --

JUDGE WALSTON: Yes.

MS. FORLANO: Thank you.

JUDGE WALSTON: Why don't we go ahead and take a ten-minute break. I need to make a phone call. You can be passing it out and we'll go off the record. We'll resume at let's say 5:15.

(Recess: 5:01 p.m. to 5:13 p.m.)

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(Exhibit AP No. 12 marked)

JUDGE WALSTON: Let's go back on the record. And, Ms. Forlano, you can proceed.

Q (BY MS. FORLANO) Dr. Wilder, in front of you you have what has been marked as Aligned Protestants' Exhibit 12. Could you tell us what the first couple of pages are -- they appear to you?

A This is an affidavit for authentication of business records.

Q And the first page is for industrial hazardous waste database for Montgomery County for January 1, 2007 through December 31, 2008?

No, look at the affidavit of business records.

A Oh, okay.

Q We're still on that page.

A Okay. Yes, the industrial hazardous waste database and summary data for Montgomery County, Texas for the period January 1, 2007 through December 31, 2008.

Q If you could do me -- everyone do me a favor and take out the second page of the affidavit of business records. I did not mean to include that. I think that goes for another compact disk that was produced. So we're just looking at what's APP1006938.

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And could you look at the stack of documents underneath that, the big stack, and can you tell me what that is?

A These are the waste manifests or shipping reports that I referred to earlier that are generated by TCEQ for monitoring waste generation and delivery to waste disposal facilities.

Q These are marked APP1006940 to APP1008028?

A Correct.

MR. RILEY: If it will help matters -- move matters along, we have no objection if you want to put this in the record --

MS. FORLANO: I do want to put this in the record --

MR. RILEY: -- not sure anybody else wants it in there.

(Laughter)

MS. FORLANO: Well, I'm going to offer this as Aligned Protestants' Exhibit 12.

JUDGE WALSTON: Any objections?

MR. RILEY: No.

JUDGE WALSTON: There being no objections, Aligned Protestants' Exhibit 12 is admitted.

(Exhibit AP No. 12 admitted)

Q (BY MS. FORLANO) You understand this to be the records that Mr. Bost relied upon in calculating his

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numbers for how much waste is generated in Montgomery County. Is that correct?
A Yes.
Q Would you please turn to Page APP1007084?
A Okay.
Q And can you identify the waste code for the fourth entry?
A That's Waste Code 00121191.
Q And is this the waste code that you understood Mr. Bost specifically looked at when it came to Conroe Plant Huntsman?
A Yes.
Q How much does -- let me ask you this: At the top of the page on the left, it says "period covered." What does it say?
A The period covered on this report is 2007.
Q And it says in the middle "From Annual Waste Summary Reports." Is that correct?
A Yes.
Q So what do you understand this particular page to be?
A These are the Annual Waste Summary Reports for large quantity waste streams. The report package doesn't contain this type of -- annual summarization for all wastes, but it does for wastes that appear in large

1401

quantities apparently.
Q So you understand this to be the amount that Huntsman produced of that particular waste in 2007?
A Yes.
Q And how much does it say -- does this Annual Waste Summary Report say was produced by Conroe Plant Huntsman for waste 00121191?
A This says 223,729,850 pounds.
Q So this is what you looked at in formulating your testimony as to the amount that Huntsman was producing. Is that correct?
A Yes. This and I did some back-up calculations to -- I actually went through the individual entries in the report to substantiate that their annual summary was in line with the monthly reports.
Q So you looked at the monthly reports that are behind this?
A Yes.
Q And Huntsman starts on this page and it ends on -- just their Conroe Huntsman reports alone -- end on Page APP1007967. Is that correct?
A I'm trying to get to it. Did you say 7967?
Q I did. No, I'm sorry. I got it wrong.
A I believe it's 7955.
Q That is correct. It is 7955.

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Would you agree with me that that is -- the vast majority of this document is Conroe Plant Huntsman Texas manifest records?
A Yes.
Q Can you just count up the manifest records that are listed per page to figure out how many trucks are going out of Conroe Plant Huntsman per day?
A On some of the pages you can. Now, the first few pages list more than just one type of waste. So they -- but they do appear to list each load separately, yes.
Q So you could just look at that particular waste code, that 00121191, count up how many records there are and figure out how many trucks carried that waste?
A That would be one way to do it, yes.
Q So when you got questioned earlier about your figures for trucks where you figured 18 to 20 trucks, you could actually back that up with the manifest -- just by looking at the number of manifests in this record?
A Yes.
Q Do you have any idea how Mr. Bost came up with his 4.7 billion figure?
A No, I don't.
Q And do you have an estimate for 2008, how much

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Conroe Plant Huntsman produced for 2008?
A I believe I had about -- I want to say 227 -- it was either 227 million or 235 million, somewhere in that ball park. It was slightly larger than the year before.
Q Now, for 2008 is there an actual annual waste summary contained in these records like there is for 2007?
A I don't believe so.
Q So you actually went in and hand calculated all of the records for 2008?
A Yes.
Q Does Conroe -- I'm sorry, Chevron Phillips, are they called something else in these records?
A I think there's, like, a Performance Chemical or some other name that they might go by.
Q Is it Drilling Specialties?
A Drilling Specialties. Thank you.
Q Do they -- could they -- if Mr. Bost said that 99.9 percent of the waste was produced by Huntsman and Chevron Phillips, could Chevron Phillips have produced the other 4.5 billion pounds of waste that Mr. Bost says was produced?
A Not according to these records, no.
Q Thank you. Just in Montgomery County alone,

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looking at these records, is there a need for a -- an injection waste well disposal facility in your opinion?
A In my opinion, no.
Q Are all of the waste disposal needs for Montgomery County being met for Class 1 non-hazardous wastewater?
A Yes.
Q And if Huntsman does not go with TexCom and uses its facility for its waste disposal needs, then all of Mr. Bost's figures would have to be thrown out the window, wouldn't they, for savings -- for cost savings, for transportation cost savings, for mileage, for trucks, all of it. Wouldn't that all have to be thrown out the window?
A It would no longer be valid. Yeah, that's correct.
Q Thank you. Let me ask you about pretreatment a little bit, because you've been asked that. Is pretreatment -- pretreatment is, would you agree -- is pretreatment a viable option for generators in order to dispose of wastewater?
A Yes.
Q And pretreatment, it can be done by any generator. Isn't that correct?
A If they have a stream that allows -- that's

1405

amenable to pretreatment, yes, it can be done by any generator.
Q Is the waste code 00121191 produced by Conroe Plant Huntsman, can it be subjected to pre-treatment?
A I haven't seen any chemical data specific to that waste stream, so potentially yes.
Q And whether or not a generator uses some kind of pretreatment program, that's just a matter of cost for them. Isn't that correct?
A Cost and availability of technology. Some streams can't be pretreated to the level at which the -- either a POTW or, for that matter, even a Class 1 non-haz injection well could accept it.
Q Does TexCom require some kind of pretreatment in order to inject the wastewater?
A Pretreatment by the generator?
Q Or pretreatment by TexCom. Does the wastewater have to be treated in some way before it goes into the well?
A In some of the testimony I looked at, yes, it indicated that the injectate had to be within certain parameters or within certain limits of certain parameters, I should say. And ostensibly that would require pretreatment.
Q So that would just be another cost added on

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that TexCom would have to add for its services?
A Yes.
Q Are you aware of how many permits Newpark Big Hill has for injection wells?
A I believe they have permits for six wells.
Q Do you know how many of those permits that there's actually -- do you know how many injection wells Newpark actually has currently running?
A I believe two.
Q So they have the potential of drilling four more. They've already got the permits for that?
A Yes.
Q Do you have any idea if Newpark or Environmental Processing Systems in Liberty County are at or near their capacity?
A I don't know.
MS. FORLANO: If you would just give me a moment, Your Honor.
With that I pass the witness.
JUDGE WALSTON: Lone Star?
MR. HILL: No questions, Your Honor.
JUDGE WALSTON: Individual Protestants?
MR. FORSBERG: No questions, Your Honor.
JUDGE WALSTON: Denbury?
MR. SENCENBAUGH: No questions, Your

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Honor.
JUDGE WALSTON: Public Interest?
MR. HUMPRHEY: None, Your Honor.
JUDGE WALSTON: TexCom?
MR. RILEY: Just a few.

RECROSS-EXAMINATION

BY MR. RILEY:
Q I know you haven't been here for the entirety of the testimony, but I think you were here today at least. Is that correct?
A Some of today, yes.
Q Some of today.
A From about 11 o'clock on.
Q And you may not have heard this testimony, so let me ask you first before I ask you questions about it, about why an operator of a Class 1 -- why Newpark might permit more than one well. Have you heard any testimony regarding why a commercial Class 1 injection well operation such as Newpark, such as the one TexCom proposes, why they might permit more than one well?
A I don't know that I heard testimony to that effect. In my opinion, it would be something where you get some savings from economy of scale. If you're going through the permitting process, if you've got the consultants hired to do it, it's not -- it shouldn't

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cost nearly as much to get six permits in one fell swoop, even though you don't actively construct the wells. That way, if your capacity starts to limit out, you can go ahead and proceed with installation or construction of an additional well.

Q Well, I think the concepts might be a little different in this application that as we -- you may have heard -- I think it was Mr. Fairchild's testimony about how injection wells begin to operate, at least geologically speaking, as one. If the injection is constant into three wells in terms of pressure development in the reservoir they operate as one. Did you hear that testimony?

A I heard him testifying on some of the -- I think those were CO2 injection wells, and I allowed myself to do review some of my own paperwork, so I wasn't --

Q That's okay. If I'm right and he was talking about injection wells of any type -- what I'm trying to get to is there's at least one expert who has testified in this case that these permitted wells, potentially even the Newpark case, though he wasn't asked about that specifically, the permit wells are for the potential for -- a wellbore to -- I'll call it go bad. That's probably not the right technical term -- but the

1409

wellbore will no longer accept waste and it needs to be worked over.

A Yes.

Q All right. And I think that expert testified that that's often a reason that an operator or someone such as TexCom might apply for more than one well at a location. Does that make sense to you?

A Oh, certainly. You definitely want some redundancy in a system like that.

Q Okay. So it's not so simple as Newpark has a permit for six wells and only has two in operation that that means it has four more that it could put into operation at any time. Is that the way you understand it?

A Well, they could certainly start constructing more wells up to the permit limit.

Q But if those wells are completed into the same injection interval, then the limitation won't be number of wells, it will be pressurization of the reservoir. Would you agree with me?

A Yes.

Q Do you have any technical knowledge of the Newpark operation in terms of their injection rates or limitations on pressures or anything of that nature?

A No. I believe in discussion once with an

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individual there -- with an individual about that facility, we talked about a 300-gallon-per-minute injection maximum across the two wells they have operating.

Q Okay. And it's possible that the 300-gallon-per-minute limitation is in their permit and would apply to all six wells. Is that possible?

A I suppose, yes.

Q And in this case you probably read enough of the application to know that there is a 350-gallon-per-minute limitation that applies whether using one well or the four wells that TexCom has applied for. Do you understand that?

A Yes.

Q Would you expect the gallon limitation to be the same in the Newpark application?

A Yes.

Q In your work, do you ever do population growth estimates?

A I'm not trying to be funny here -- for humans?

(Laughter)

Q Sure. Why not?

A Well, I mean, I do a lot of work with bacteria and, you know, biological reactors and things like that. I have taken a look at some population growth estimates

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over the years for certain facilities, yes.

Q And in landfill permitting again, something I do a lot more of, frankly, there's a requirement to estimate population growth and anticipate waste needs from -- resulting from the growth in population.

A Yes.

Q When Ms. Farlano asked you questions about whether there's a need, I assume you're answering that question -- all right, need for a Class 1 waste disposal well in Montgomery County, I assume you're answering that question in the present tense. Is that right?

A Present or near future tense, yes.

Q Okay. Let's suppose through the -- at least in these economic times that somebody wants to locate a facility in Texas of a type like the Huntsman facility, just as an example, and they're looking for locations. Is that a reasonable hypothetical?

A Yes.

Q And that somehow we are restoring some of our manufacturing base in this country and some company is looking for a site to select, and Montgomery County is in the pool of potential locations. Is that a reasonable expectation?

A Yes.

Q Because I know there's a lot of undeveloped

1412

land in Montgomery County. Is that right?
A That's correct.
Q Have you ever heard the expression in terms of government finance that rooftops don't pay for themselves?
A I'm not really sure that I have.
Q Okay. And the notion I think is that residential property taxes generally don't cover the expenses of government by property taxes alone?
A I get the gist, I just hadn't heard it put that way before.
Q Would you agree with the statement?
A Yes.
Q So if a commercial facility such as the TexCom operation were looking for a new location, would you think it would be an advantage for Montgomery County to have economic wast disposal capacity?
A Depending on the types of facilities you would hope to attract, it's possible.
Q All right. So let's suppose it's a Huntsman facility -- let's call it Riley's Chemical Plant. And Riley's Chemical Plant is looking for a location, and they're looking at Montgomery County because it's got lovely residential space and the Woodlands and there's other attractive features to Montgomery County. Would

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it be an attractive feature in your mind if there were waste disposal capacity given that I had to get rid of 235 million pounds of wastewater?
A Possibly, although I think in terms of a siting study, looking at access in terms of bringing your materials in, I'm really not sure why Huntsman is exactly where it is. Possibly it was -- maybe it was related to the field. That is something I've thought about over the last few months.
These days, in terms of siting a large petrochemical complex like that, very few of them go in non-coastal zones, and even fewer of them go into an area where there's not a major navigable river.
Q And that's fair. But let's assume that for other reasons -- there are other considerations, I assume, when siting a new facility. Is that right?
A Yes.
Q And proximity of the coast may be one of them, but it's not the only one. Is that right?
A That's correct.
Q If that were the case then -- let's say, for instance, that it was a densely populated coast such as the Texas coast in terms of industry, and that the waste disposal availability was limited because of these existing industries --

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A Uh-huh.
Q Could it be then a positive for Montgomery County for a company looking to site a facility that has significant waste disposal expenses, could it be a positive that TexCom has a proposed well there or has a well there?
A Potentially, I suppose.
Q Are you involved in any other cases on behalf of Montgomery County that are -- that would be in opposition to other waste disposal facilities?
A No.
MR. RILEY: No further questions. Thank you, Judge.
JUDGE WALSTON: Executive Director?
MS. GOSS: No questions.
JUDGE WALSTON: Any redirect?
MS. FORLANO: We do not.
JUDGE WALSTON: Dr. Wilder, thank you very much --
WITNESS WILDER: Thank you --
JUDGE WALSTON: -- get you out of here today --
WITNESS WILDER: Greatly appreciate it. Thank you.
JUDGE WALSTON: Let's go off the record

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for just a moment.
(Recess: 5:35 p.m. to 5:38 p.m.)
JUDGE WALSTON: Back on the record. For the record, we had an off-the-record discussion and the Aligned Protestants rests, I guess?
MR. WALKER: We do, Your Honor.
JUDGE WALSTON: We'll begin at eight o'clock as we began this morning, and we'll go late to finish up tomorrow. We just encourage everybody to laser in on questions and be sure and counsel your witnesses to give concise and direct answers.
(Proceedings recessed at 5:38 p.m.)

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